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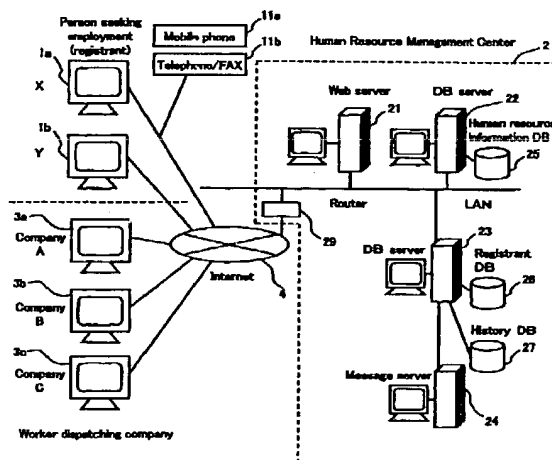
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## (54) A human resource management service system

(57) An object is to provide a human resource management service system which makes it possible to perform human resource management necessary for the operations of worker dispatching companies utilizing the system without introducing any special equipment and also to greatly save time for the person seeking employment to register plural worker dispatching companies. By connecting the terminal device of a person seeking employment, the human resource management center, and the terminal devices of worker dispatching companies via network, management center on the network unitarily renders services. The management center provides the person seeking employment with the service to register, via the network, human resource information including the person's experiences, skills, and qualifications by designating the worker dispatching company the information is to be registered with. The management center stores, when the person seeking employment designates the company the information is to be registered with, a part or the whole of the human resource information of the person seeking employment as primary information of the registrant, which can be referred to and retrieved by the designated company, and stores, in a read-write enabled state, secondary information per company in relation to the primary information with respect to the registrant, thereby providing the companies with the service making the primary and secondary information available via the network.

[Fig. 1]



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## Description

### Background of the Invention

#### Field of the Invention

[0001] This invention relates to a human resource management service system utilizing a network for providing a person seeking employment with a service enabling a registration of the human resource information such as his experiences, qualifications, and skills with at least one or more worker dispatching companies he desires and selects at his own initiative, and for providing the worker dispatching companies with a service enabling management of a series of dispatching operations such as selecting a person to be dispatched suitable for their clients' labor demands from among a number of registrants by utilizing the registered human resource information, notifying job announcements to the selected registrants, allocating and recording the dispatching history of the registrant.

#### Description of the Prior Art

[0002] The utilization of labor from so-called worker dispatching companies as a form of utilizing the human resource (manpower) by enterprises is showing a serious spread. In particular, since the Manpower Dispatching Business Law (hereinafter referred to as the "Dispatching Law") is to be revised soon and the object operations for worker dispatching will as a rule be free from the current restriction of limiting to 26 objects, it is expected that the environments surrounding the persons seeking employment, worker dispatching companies, and the enterprises utilizing those persons and companies will face a revolutionary age.

[0003] Steps taken in the dispatching operations are such that a person seeking employment first registers with a desired worker dispatching company and, the company then selects a registrant suitable for the needs of the enterprise user from among a number of persons registered with the company (hereinafter referred to as "registrant") to introduce the selected registrant to the enterprise user, concludes an employment contract with the registrant if an agreement is reached as to working conditions, etc., and has the registrant work as a dispatched worker at the client enterprise.

[0004] In order to speedily and efficiently carry out such dispatching operations, the worker dispatching company has generally employed a management method in which by providing a computer system in the company, the human resource information such as registrants' experiences, skills, and qualifications is stored as data base per registrant.

[0005] However, a considerable investment in equipment is indispensable for introducing the computer system in the company and it is not practical, except for major companies, for medium-and small-sized worker

dispatching companies to bear such considerable burden from the aspect of labor and cost inclusive of system development and system maintenance.

[0006] Meanwhile, a person seeking employment generally registers with a plurality of worker dispatching companies concurrently so as to ensure constant employment. In this case, it is necessary for the person seeking employment to investigate the information of a number of worker dispatching companies and pinpoint the specific worker dispatching company or companies he desires to register with upon comparative reviewing, and take registration procedure as required by each company.

#### Summary of the Invention

[0007] Accordingly, it is an object of this invention to solve the above-mentioned problem and provide a human resource management service system enabling human resource management necessary for a worker dispatching company without any particular equipment being introduced by the company using the system. It is another object of this invention to provide a human resource management service system enabling a person seeking employment to greatly save time for registering with a plurality of worker dispatching companies by allowing the plurality of worker dispatching companies to share under a predetermined restriction the human resource information regarding the persons seeking employment, who is registered in common with the plurality of companies.

[0008] According to one aspect of this invention, a human resource management service system comprises a terminal device of a person seeking employment; a human resource management center; and a plurality of terminal devices of worker dispatching companies; the terminal devices being connected to the human resource management center via network, whereby the human resource management center on the network centrally renders services to the terminal device of the person seeking employment and the terminal devices of the worker dispatching companies via the network. The human resource management center provides the person seeking employment with a service to register human resource information including the person's experiences, skills, and qualifications by designating at least one of the worker dispatching companies the human resource information is to be registered with; stores, when at least one of the worker dispatching company is so designated by the person seeking employment, a part or the whole of the human resource information of the person seeking employment as primary information for its registrants which can be referred to and searched by the designated worker dispatching company; and provides the plurality of worker dispatching companies with a service to store, in a read-write enabled state, secondary information per the worker dispatching company and enables utilization of

the primary and the secondary information, the secondary information being associated with the primary information with respect to the registrants. Thus, the person seeking employment can select at his own initiative one or more worker dispatching companies he desires to register and easily register the human resource information on including his experiences, qualifications, and skills with these worker dispatching companies via his terminal device connected to the network. Also, the plurality of worker dispatching companies can easily perform the human resource management of the registrants registered with them by accessing the human resource management center via the company's terminal device connected to the network without installing any particular in-house equipment for human resource management.

[0009] Hereupon, the secondary information per worker dispatching company may desirably include history information related to the registrant and arising in relation to the dispatching operations, thereby the worker dispatching company is able to refer to, retrieve, and update the dispatching records of its registrants.

[0010] According to another aspect of this invention, a human resource management service system comprises a terminal device of a person seeking employment; a human resource management center; and a plurality of terminal devices of worker dispatching companies; wherein the terminal devices are connected to the human resource management center via network whereby the human resource management center on the network centrally renders services to the terminal device of the person seeking employment and the terminal devices of the worker dispatching companies via the network. The terminal device of person seeking employment has means for inputting human resource information including the person's experiences, qualifications, and skills by designating at least one or more of worker dispatching companies the person seeking employment desires to register the information with. The human resource management center comprises human resource information storage means for storing the input human resource information; registrant information storage means having areas allotted for each of the plurality of worker dispatching companies, a part or the whole of the input human resource information corresponding to the person seeking employment from the human resource information storage means being stored as registrant information of registrant into the areas allotted for the particular worker dispatching company or each of plural worker dispatching companies upon designation by the person seeking employment; history information storage means with areas allotted for each of the plurality of worker dispatching companies, the history information related to the registrant, the history information arising in relation to dispatching operations for the registrant; and information management means for managing the information stored in the human resource information storage means, registrant

information storage means and history storage means. The terminal devices of worker dispatching companies comprising input/output means for referring to, retrieve and update the aforementioned registrant information stored in the registrant information storage means and the history information stored in the history information storage means via the information management means.

[0011] With the constitution as stated above, when the person seeking employment inputs the human resource information including his experiences, qualifications, and skills via the terminal device, the information is first stored in the human resource information storage means and then partially or wholly stored in the area within the registrant information storage means, which area is allotted exclusively for the worker dispatching company designated for the registration by the registrant. Therefore, since the data base of the company's registrant information is automatically structured merely upon the person seeking employment's selection of the worker dispatching company at his own initiative, the worker dispatching company can select a person suitable for dispatching from among the company's registrants promptly and occasionally by referring to and retrieving the information via the company's terminal device. Furthermore, since the worker dispatching company is always able to structure the updated data base relating to the company's registrants by updating the information as regards the present status (dispatching situation) and dispatching history of the company's registrants in the registrant information storage means and history information storage means through inputting, correcting or otherwise, the worker dispatching company can enjoy the benefit equivalent to the introduction of an exclusive management system for the company.

[0012] Now, the input means provided for the terminal device of the person seeking employment and the input/output means provided for the terminal devices of the aforementioned plurality of worker dispatching companies include but not limited to electronic terminal devices such as a personal computer with a Web browser installed, a mobile phone capable of referring to the Web page or a personal digital assistant. Also, the human resource management center may desirably be provided with the Web server on the internet and the data base server for managing the information stored in each of the aforementioned human resource information storage means, registrant information storage means, and history information storage means. Here-with, by connecting to internet and by using the electronic terminal device enabling reference to the Web page, the human resource management service can easily be available.

[0013] Also, it is desirable in the human resource management service system according to the another aspect of the invention, that the human resource management center is provided with a message server having storage means for storing, in advance, messages

which the worker dispatching companies desire to send; and transmitting/receiving means for selectively transmitting a predetermined message to a predetermined registrant of the worker dispatching company in accordance with the procedure designated in advance, and receiving a reply to the predetermined message from the registrant; and the information management means stores the reply received from the registrant into the registrant information storage means and/or history information storage means.

[0014] Thereby, for example, having the message server sent a predetermined messages to the registrant's telephone, FAX and mobile phone and receive the reply enables making an appointment with the registrant, confirmation of the registrant's working status, storing the registrant's reply as the company's registrant information and/or history information, and management thereof in real time.

#### Brief Description of the Drawings

[0015] The invention will be explained in more detail in conjunction with appended drawings, wherein:

Fig. 1 is an explanatory drawing showing the constitution of the human resource management service system of the preferred embodiment according to this invention;

Fig. 2 is an explanatory drawing showing an example of part of the information stored in the human resource information DB;

Fig. 3 is an explanatory drawing showing an example of part of the information stored in the registrant DB;

Fig. 4 is an explanatory drawing showing an example of part of the information stored in the history DB;

Fig. 5 is an explanatory drawing explaining the basic functions of the human resource management service system of the embodiment according to this invention;

Fig. 6 is a flowchart showing an example of appointment processing in which the functions of the human resource management service system of the embodiment according to this invention are utilized; and

Fig. 7 is a flowchart showing an example of the working status confirmation processing in which the functions of the human resource management service system of the embodiment according to this invention are utilized.

#### Detailed Description of the Preferred Embodiments

[0016] A preferred embodiment of the invention is explained with reference to the drawings as follows:

[0017] Fig. 1 shows the human resource management system according to a first preferred embodiment

of this invention. The system is, as the basic configuration, provided with terminal devices (personal computers) 1a and 1b each with a Web browser installed and owned by persons seeking employment X and Y respectively, human resource management center 2, and terminal devices (personal computers) 3a, 3b, and 3c also with a Web browser installed and each owned by worker dispatching companies A, B, and C respectively. These terminal devices 1a, 1b, 3a, 3b, and 3c, and human resource management center 2 are connected via internet 4. Human resource management center 2 is provided with a Web server 21, a first data base server 22, a second data base server 23, and a message server 24, these being connected to LAN 28 to constitute a network and at the same time connected to internet 4 via router 29. It is noted that 11a is a telephone/FAX owned by the person seeking employment X and 11b is a mobile phone also owned by the person seeking employment X.

[0018] The Web server 21 is a server to provide data base service to the user accessing via internet 4. In the preferred embodiment of this invention, the Web server 21 is provided with an ordinary CGI (Common Gateway Interface, not shown), wherein instructions are given to the first and second data base servers 22 and 23 in accordance with the requests from the users, i.e., unspecified number of persons seeking employment (registrants), and worker dispatching companies utilizing the system, and at the same time, HTML documents are generated based on the replies from both data bases and transmitted to the user. The first data base server 22 has human resource information DB 25 while the second data base server 23 has registrant DB 26 and history DB 27 per worker dispatching company, these having DBMS (Database Management System) just as an ordinary data base server.

[0019] Figs. 2, 3, and 4 show part of the information stored in the aforementioned human resource information DB 25, registrant DB 26 and history DB 27 for example. Herein, Figs. 2, 3, and 4 are, for convenience for explanations, expressed in the form of table; and these tables are not intended for describing any specific data configuration of each DB or relationship, etc. of each data.

[0020] Human resource information DB 25 is a storage means for storing human resource information including job experiences, skills, and qualifications the persons seeking employment input by operating the terminal devices 1a and 1b respectively. As shown in Fig. 2, with respect to registrant A for example, the address, contact phone/FAX number, e-mail address, job history (5 years, accounting clerical work), qualification (book-keeping), skills (PC, word processor), and other human resource information input by the person seeking employment are stored as is. R123 shown in Fig. 2 is the ID given to registrant X and the information of registrant X is managed with the ID as the flag.

[0021] The registrant DB 26 is the storage means

for storing the partial or whole human resource information of the person seeking employment into the storage area allotted for each designated worker dispatching company as the registrant information of the company in accordance with the designation of the worker dispatching company by the person seeking employment. Fig. 3 shows part of the example of the registrant information stored in the area allotted to worker dispatching company A in the case persons seeking employment X and Y designate the registration with the company A at the time of aforementioned inputting, and therein included are the present status (the current working status of the registrant: either working or not working is input for example) input by worker dispatching company A in its own, the work starting date and working period if the registrant is working, in addition to the basic information on the registrants such as the job history, qualification, and skills. The registrant information on the is managed by ID (X: R123, and Y: R124, . . . ) given for each registrant.

[0022] The history DB 27 is the storage means for storing history information arising in relation to dispatching operations for the registrant registered with the worker dispatching company into the storage area allotted to each worker dispatching company, wherein the history information is associated with the registrant. Fig. 4 shows part of the example of the history information of worker dispatching company A. Herein, the past dispatching record of the registrant is stored in a time series as dispatching record 1, dispatching record 2, . . . dispatching record N and managed by ID (X: R123, Y: R124, . . . ) given to each registrant.

[0023] Message server 24 has storage means 31 to prestore the message desired by the worker dispatching company and a transmitting/receiving means 32 to give the predetermined registrant of the company the notice of the preset messages in a selective form in accordance with the procedure designated in advance, and at the same time to receive from the registrant a reply to the notice. The details of the functions thereof will be explained later.

[0024] The basic functions of the human resource management service system consisting of the above configuration of the preferred embodiment according to this invention are explained with reference to Fig. 5. Now, Fig. 5 shows the example in the case the person seeking employment X designates the registration with the worker dispatching company A, in which elements similar to those described with reference to Fig. 1 are denoted by the same reference numerals.

[0025] First, the person seeking employment X accesses human resource management center 2 by operating his terminal device (personal computer with a Web browser installed) 1a to connect to the internet. The home page of human resource management center 2 is then displayed on the screen with the menus such as "new registration page", "registrant page", "worker dispatching company page", etc. appearing. By clicking

the menu of "new registration page", the screen specially designed for new registration is displayed with the appearance of columns for entering name, date of birth, address, contact phone/FAX number, e-mail address, job history (5 years, accounting clerical work), qualification (bookkeeping), skills (PC, word processor), and other information to be input by the person seeking employment, and also the check box of plural worker dispatching companies receiving the service provided by the system. The person seeking employment X inputs human resource information in the columns for entering the information, enters a check mark in the check box of the worker dispatching company he desires to register with, that is, worker dispatching company A in this case, clicks the "registration" button for transmission to human resource management center 2 (the above is referred to Step S1).

[0026] When receiving the request for the registration of human resource information from the person seeking employment X, the human resource management center 2 accesses the human resource information DB 25 of data base server 22 via Web server 21, and thereupon the human resource information of person seeking employment X is written and stored. Also, which worker dispatching company the person seeking employment X has designated to register with is checked, thereby a part or the whole of the human resource information of person seeking employment X stored in the human resource information DB 25 is written and stored as is into the area allotted to the company A designated by registrant X among registrant DB of data base server 23 (the above is referred to Step S2).

[0027] The worker dispatching company A accesses the human resource management center 2 by operating the terminal device of the company (personal computer with a Web browser installed) 3a to connect to the internet. By clicking the "worker dispatching company page" menu on the home page of human resource management center, the dialogue box for authorization input is displayed, and by inputting ID and password exclusively used for worker dispatching company A, the specific screen including menus of reference to, retrieving, and updating the company's registrant information and history information is displayed. Hereupon, as stated above, although the registrant information and history information are stored respectively in the area allotted to each of the worker dispatching companies among the registrant DB 26 and the history DB 27, access by worker dispatching company is security-controlled by server 23 in the manner so that the access is limited to only the information stored in the area allotted to the company. Therefore, the access of worker dispatching company A is limited to its own registrant information and history information.

[0028] Now, in the case the worker dispatching company A retrieves from the registrant DB to select suitable registrants in response to a request from a cli-

ent enterprise asking for worker dispatching, an example of selecting a person having an "accounting" experience stated in the job history is given. The worker dispatching company A inputs "accounting" as a retrieve condition on the retrieve menu screen for transmission to the human resource management center 2. Then, in the human resource management center 2, the Web server 21 receives the request and transmits the SQL statement to the DBMS of data base server 23. The DBMS of data base server 23 accesses the registrant DB 26 in accordance with the SQL statement to retrieve "accounting" as a keyword. As shown in Fig. 3, since the registrant X has a job history of "accounting", the retrieve results includes the registrant X as a suitable person (Step S3). It should be noted that although the example herein refers to a method in which the DBMS of data base server 23 performs retrieval in accordance with the SQL statement, it is needless to say that, other than the method stated above, the method of retrieving the whole statement of the text data is also applicable.

[0029] The data base server 23 transmits the retrieve results to the Web server 21. Then, the Web server 21 prepares HTML by using the CGI function to transmit it to the terminal device 3a of worker dispatching company A. When the terminal device 3a of worker dispatching company A receives the HTML, the retrieve results are displayed on the screen. In this way, the worker dispatching company A selects suitable persons from among the registrants of the company and comes to know that the registrant X is included in the selected persons (Step S4).

[0030] Next, based on the retrieve results so obtained and by utilizing the human resource management service system of the preferred embodiment according to this invention, the processing in which the worker dispatching company A makes an appointment with the registrant X is explained with reference to Fig. 5 and Fig. 6. First, the worker dispatching company A retrieves and selects suitable registrants in accordance with the above Step S3 and Step S4 (Step S11).

[0031] Next, the worker dispatching company A gives an instruction to the message server 24 to give notice to the registrant X so selected to the effect that the company's client enterprise requested of the company to dispatch a worker and the company wishes to have the registrant's reply thereto. In this case, worker dispatching company A may give the server an instruction so as to give the notice by selecting a predetermined message from among the messages stored in advance in message storage means 31 by following the preset instruction indicated on the screen of the company's terminal device 3a, or the company may give an instruction, by inputting a new message and registering it in the message storage means, to the effect that the notice of the new message should be given (Step S12).

[0032] The message server 24, based on the instruction from worker dispatching company A and by

using transmitting/receiving means 32, gives message notice to the terminal device (personal computer) 1a of registrant X via e-mail, or to telephone/FAX 11a, mobile phone 11b via voice mail, FAX message transmission, etc. (Step S13).

[0033] An example of such notice for making an appointment is given to the mobile phone 11b via voice mail. The example is as follows:

"This is worker dispatching company A that Mr. X is registered with. Our client enterprise ZZ company has requested that we dispatch an accountant. If you wish to apply for the job, please input 1, otherwise input 2."

[0034] The registrant X who received this message replies by inputting 1 if he wishes to apply for the job by operating the mobile phone 11b. When receiving the reply, the transmitting/receiving means 32 of message server 24 provides the worker dispatching company A with information to the effect that the registrant X "wishes to apply for the job" and at the same time stores the information into the registrant DB within the data base server 23 as the present status information of registrant X (Step S14). Then, the worker dispatching company A makes contact with the registrant X and the client enterprise to make and determine an appointment as to interviewing and other necessary matters (Step S15). The contact from worker dispatching company A can be made by means of an ordinary telephone, FAX and also e-mail.

[0035] When the dispatching of registrant X to the client enterprise is determined, the worker dispatching company A registers the determination of dispatching to registrant DB 26 by operating the company's terminal device 3a (Step S16). Further, depending on the necessity of worker dispatching company A, the information is registered in the dispatching history of history DB 27 (Step S17). As the processing of making appointment is executed as above, the operations from the selection of suitable registrants to the notification to the registrants and receipt of reply from the registrants are automated by the human resource management center, and this enables the worker dispatching company to greatly enhance its business efficiency. Also, since the present status information and dispatching history information with respect to the registrants are stored in the data base of the human resource management center as updated information, human resource management can easily be performed based on the updated information of the company's registrants by referring to and retrieving the information at any time.

[0036] Now, as is often the case with person seeking employment, the same person is registered with a plurality of worker dispatching companies. Therefore, in order to timely determine who is available for dispatching, it is very important, for each worker dispatching company to check and confirm in real time the working

status of each registrant, such as, if the registrant of the company is working through other worker dispatching company at a point of time, if he or she is in the status of waiting for dispatching, and when he will be available for a job though he is presently working. Consequently, another example wherein the worker dispatching company A performs the confirmation processing of the company registrant's working status by utilizing the human resource management service system of the preferred embodiment according to this invention is explained below with reference to Fig. 7.

[0037] First, the worker dispatching company A accesses the company's registrant DB 26, retrieves and selects its registrants whose present status is "not working" (Step S21). Next, the worker dispatching company A instructs the message server 27 to notify each selected registrant to the effect that confirmation on the present working status is to be made and his or her reply thereto is required. In this case, the worker dispatching company A may, according to the preset instruction indicated on the screen of the company's terminal device 3a, give the server an instruction so as to give the notice by selecting the predetermined message from among the messages stored in advance in message storage means 31 or give an instruction, by inputting a new message and registering it in the message storage means, to the effect that the notice of the new message should be given (Step S22).

[0038] The message server 24, based on the instruction from worker dispatching company A and by using the transmitting/receiving means 32, gives message notice to the terminal device (personal computer) of the registrant via e-mail, or to telephone/FAX, or to mobile phone via voice mail, FAX message transmission, etc. (Step S23).

[0039] An example of such confirmation notice, is given to the registrant's mobile phone, via voice mail. The example is as follows:

"This is worker dispatching company A that Mr. X is registered with. Please confirm as to the present working status. Input 1 if you are waiting for dispatching and not working at present, input 2 if you are working on a long term basis, and input 3 if you are currently working for a short term and will soon be waiting for dispatching."

[0040] The registrant who received this message gives a reply thereto by inputting 1 if he wishes to apply for the job by operating the mobile phone (Step S 24). When receiving the reply, the transmitting/receiving means 32 of message server 24 provides the worker dispatching company A with the information to the effect that the registrant "not working and waiting for dispatching" and at the same time stores the information into the registrant DB 26 within the data base server 23 as the present status information of registrant X together with the date information of receiving the reply, to update the

information (Step S25). In this way, the worker dispatching company can timely determine yes or no for dispatching the company's registrants by checking and confirming the working status of registrants occasionally or regularly.

[0041] Now, in the human resource management service system of the preferred embodiment according to this invention, as stated above, since the person seeking employment can be registered concurrently with a plurality of worker dispatching companies he desires, there may be a conflict of worker dispatching between worker dispatching companies as a matter of course. In this case, one can consider that the worker dispatching companies competitive to each other will save time by avoiding duplicated confirmation on the working status if they can share the information with respect to the working status of an identical registrant in common. Therefore, in Fig. 5, for this purpose, an item of "anonymous working information" is added to human resource DB 25 by giving a specific ID thereto. This ID is open only to the worker dispatching companies subject to mutual agreement for opening the information regarding the registrant working status anonymously (without mentioning the company name) between the companies competitive to each other, thereby the information secrecy of the worker dispatching company is secured without opening any information more than necessary. With respect to the identical registrant managed by this ID, the worker dispatching companies can share the registrant's working status information including the present status, the starting date of work, the term of work or the like stored in registrant DB 26. Therefore, one worker dispatching company can greatly save time to confirm if a registrant of the company selected for the purpose of dispatching is presently working through other worker dispatching company.

[0042] In the human resource management service system of the preferred embodiment according to this invention, a third party system administrator who manages the human resource management service center can install the Web server, data base server, and message server within the human resource management center so that the aforementioned service can be provided on the basis of the standard specification to unspecified persons seeking employment (registrants) and a plurality of worker dispatching companies. In this case, the system administrator may endow the worker dispatching company with a right to customize the company's page, thereby enabling the company to modify the system so as to facilitate its use by designing layout, menu, etc. independently. For example, the worker dispatching company can also perform its own campaign and marketing by using the company's home page.

[0043] It should be noted that this invention is not limited to the aforementioned preferred embodiment and it is needless to say that various modifications can be made within the scope of technical idea as stated in Claims.



[0044] As explained above, according to the human resource management service system of this invention, human resource management necessary for the operations of the worker dispatching company can be performed by operating the company's terminal device connected to the network without introduction of any special equipment by the company utilizing the system. Furthermore, according to the human resource management service system of this invention, the sharing of the human resource information regarding the registered persons seeking employment by a plurality of worker dispatching companies under predetermined limitations enables the person seeking employment to save time greatly by avoiding registration with the worker dispatching companies in a conventional way, and thus the effects on the industry are most significant.

[0045] The preferred embodiment of the present invention has been disclosed by way of example and it will be understood that other modifications may occur to those skilled in the art without departing from the scope and the spirit of the appended claims.

[0046] The features disclosed in the foregoing description, in the claims and/or in the accompanying drawings may, both separately and in any combination thereof, be material for realising the invention in diverse forms thereof.

#### Claims

1. A human resource management service system comprising: a terminal device of a person seeking employment; a human resource management center; and a plurality of terminal devices of worker dispatching companies; said terminal devices being connected to said human resource management center via network, whereby said human resource management center on the network centrally renders services to said terminal device of said person seeking employment and said terminal devices of said worker dispatching companies via said network; wherein said human resource management center provides said person seeking employment with a service to register human resource information including said person's experiences, skills, and qualifications by designating at least one of said worker dispatching companies said human resource information is to be registered with; stores, when at least one of said worker dispatching company is so designated by said person seeking employment, a part or the whole of said human resource information of said person seeking employment as primary information for its registrants which can be referred to and searched by said designated worker dispatching company; and provides said plurality of worker dispatching companies with a service to store, in a read-write enabled state, secondary information per said worker

dispatching company and enables utilization of said primary and said secondary information, said secondary information being associated with said primary information with respect to the said registrants.

2. A human resource management service system as claimed in Claim 1, wherein said secondary information per said worker dispatching company contains history information related to said registrants, said history information arising in relation to dispatching operations for its registrants.
3. A human resource management service system comprising:

a terminal device of a person seeking employment;

a human resource management center; and

a plurality of terminal devices of worker dispatching companies;

wherein said terminal devices are connected to said human resource management center via network whereby said human resource management center on the network centrally renders services to said terminal device of said person seeking employment and said terminal devices of said worker dispatching companies via said network;

said terminal device of person seeking employment having means for inputting human resource information including said person's experiences, qualifications, and skills by designating at least one or more of worker dispatching companies said person seeking employment desires to register the information with;

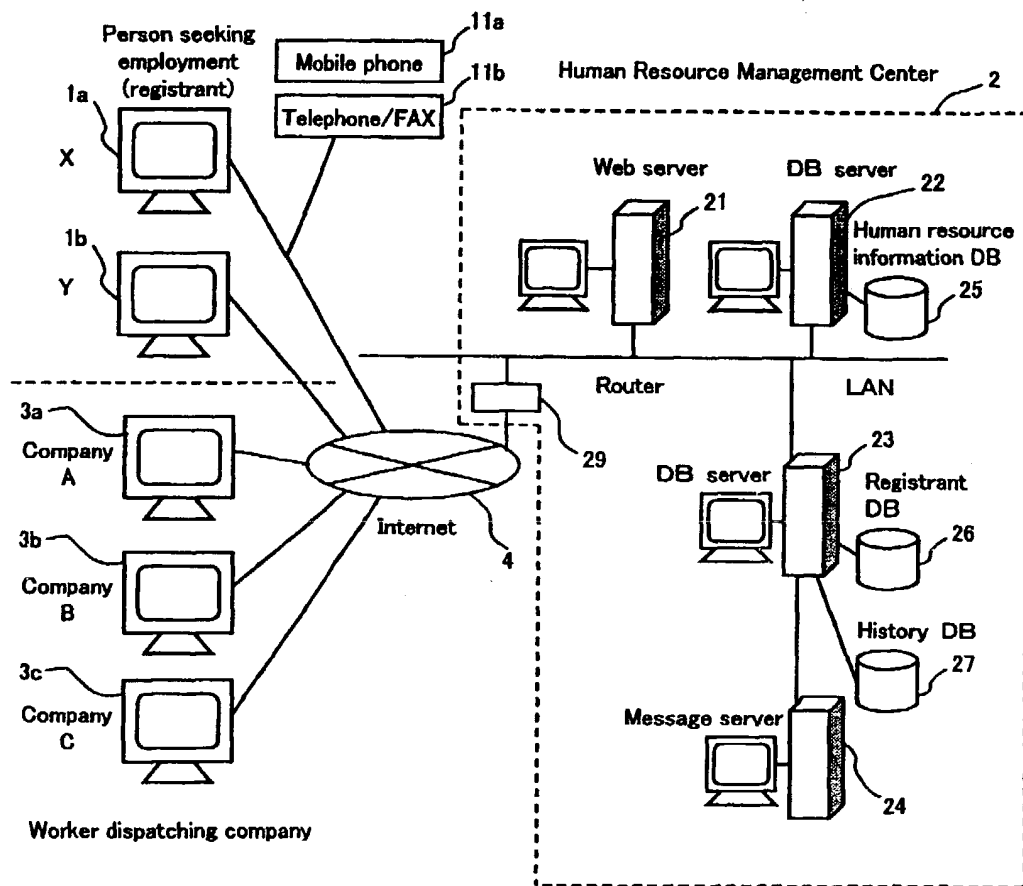
said Human resource management center comprising human resource information storage means for storing the input human resource information; registrant information storage means having areas allotted for each of said plurality of worker dispatching companies, a part or the whole of said input human resource information corresponding to said person seeking employment from said human resource information storage means being stored as registrant information of registrant into said areas allotted for the particular worker dispatching company or each of plural worker dispatching companies upon designation by said person seeking employment; history information storage means with areas allotted for each of said plurality of worker dispatching companies to store the history information related to said registrant, said history information arising in relation to dispatching operations for said registrant; and information manage-

ment means for managing the information stored in said human resource information storage means, registrant information storage means and history storage means; and

said terminal devices of worker dispatching companies comprising input/output means for referring to, retrieve and update the aforementioned registrant information stored in said registrant information storage means and said history information stored in said history information storage means via said information management means.

4. A human resource management service system as claimed in Claim 3, wherein said input means provided to said terminal device of person seeking employment and said input/output means provided to said plurality of terminal devices of worker dispatching companies are the electronic terminal devices such as personal computers with a Web browser installed, cellular phones or personal digital assistants capable of reference to Web pages, etc.; and said human resource management center is provided with a Web server on the internet and a data base server for managing the information stored in each of said human resource information storage means, registrant information storage means, and history information storage means.
5. A human resource management service system as claimed in Claim 3, wherein said human resource management center is provided with a message server having storage means for storing, in advance, messages which said worker dispatching companies desire to send; and transmitting/receiving means for selectively transmitting a predetermined message to a predetermined registrant of said worker dispatching company in accordance with the procedure designated in advance, and receiving a reply to said predetermined message from said registrant; and said information management means stores said reply received from said registrant into said registrant information storage means and/or history information storage means.

【Fig. 1】



【Fig. 2】

Human resource information

Item	Registrant	Address	Contact phone/ FAX#	e-mail address	Job history	Qualifications	Skills	Others
R123	A	...	...	...	Accounting 5 years	Book-keeping	PC, Word Processor	...

【Fig. 3】

Registrant information

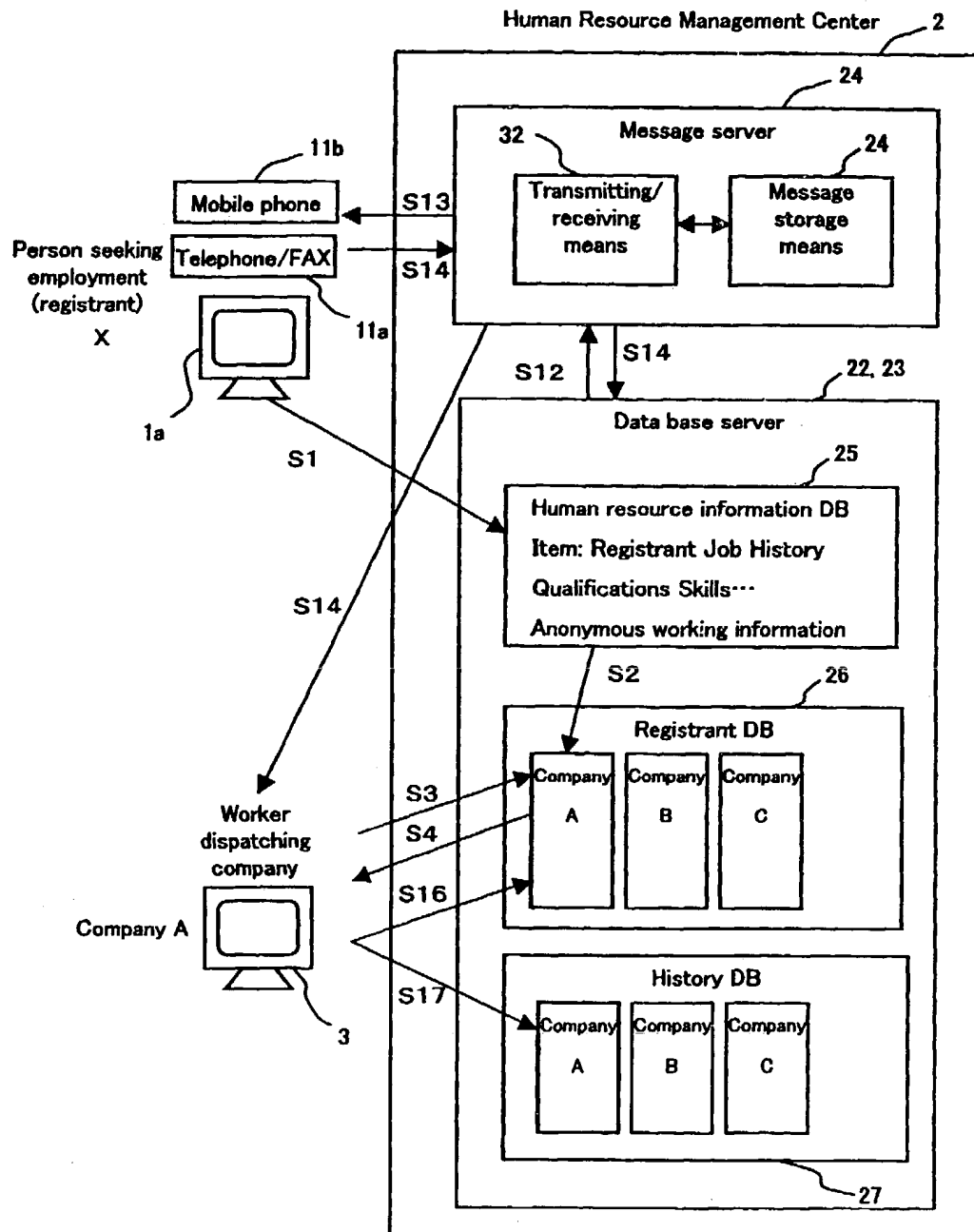
Item	Registrant	Job history	Qualifications	Skills	Present working status	Starting date of working	Term of Work
R123	X	Accounting 5 years	Book-keeping	PC, Word Processor	Working	Nov. 1, 1999	6 months
R124	Y	Translation/ Interpretation 15 years	English proficiency	PC	Not Working		
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.

【Fig. 4】

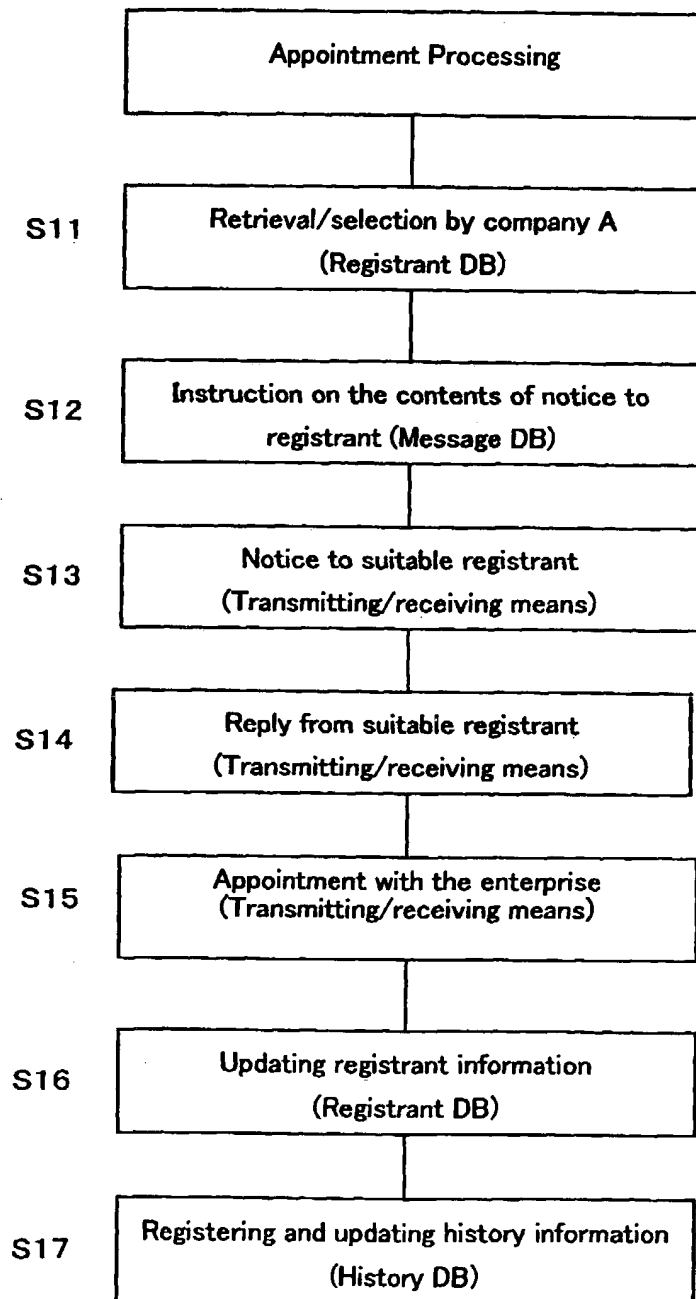
History information

Item	Registrant	Dispatch record 1	Dispatch record 2	... ..	Dispatch record N
R123	X	Accounting clerk with Co. AA from mm, dd, yyyy (starting date of dispatching) to nn, ee, yyyy (ending date of dispatching)	With Co. BB, ...	... ..	With Co. CC, ...
R124	Y	... ..	... ..	... ..	... ..
.	.	.	.	.	.
.	.	.	.	.	.

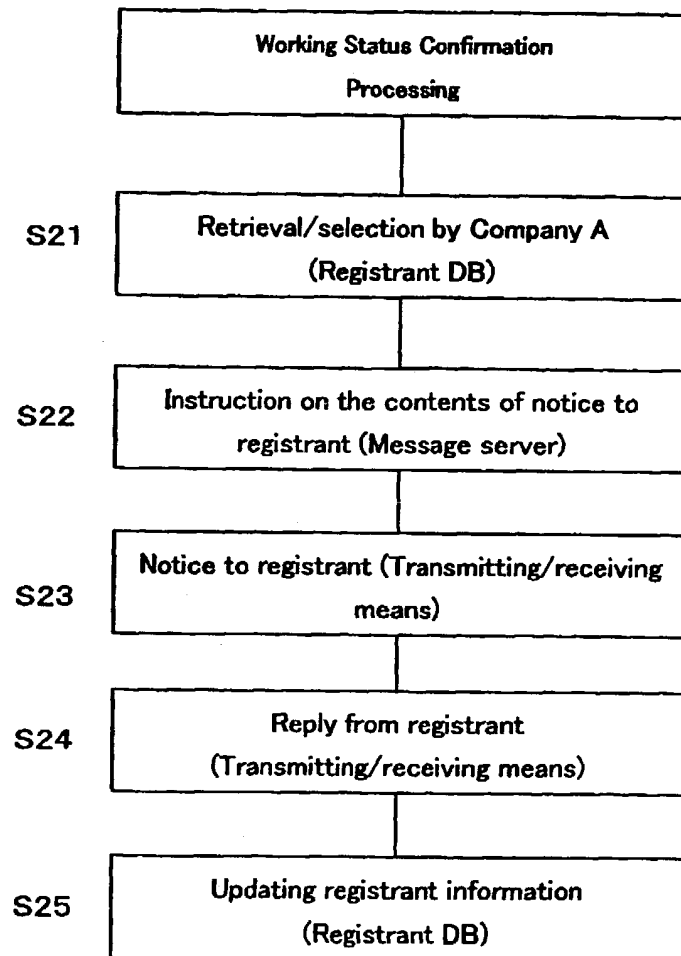
【Fig. 5】



【Fig. 6】



【Fig. 7】





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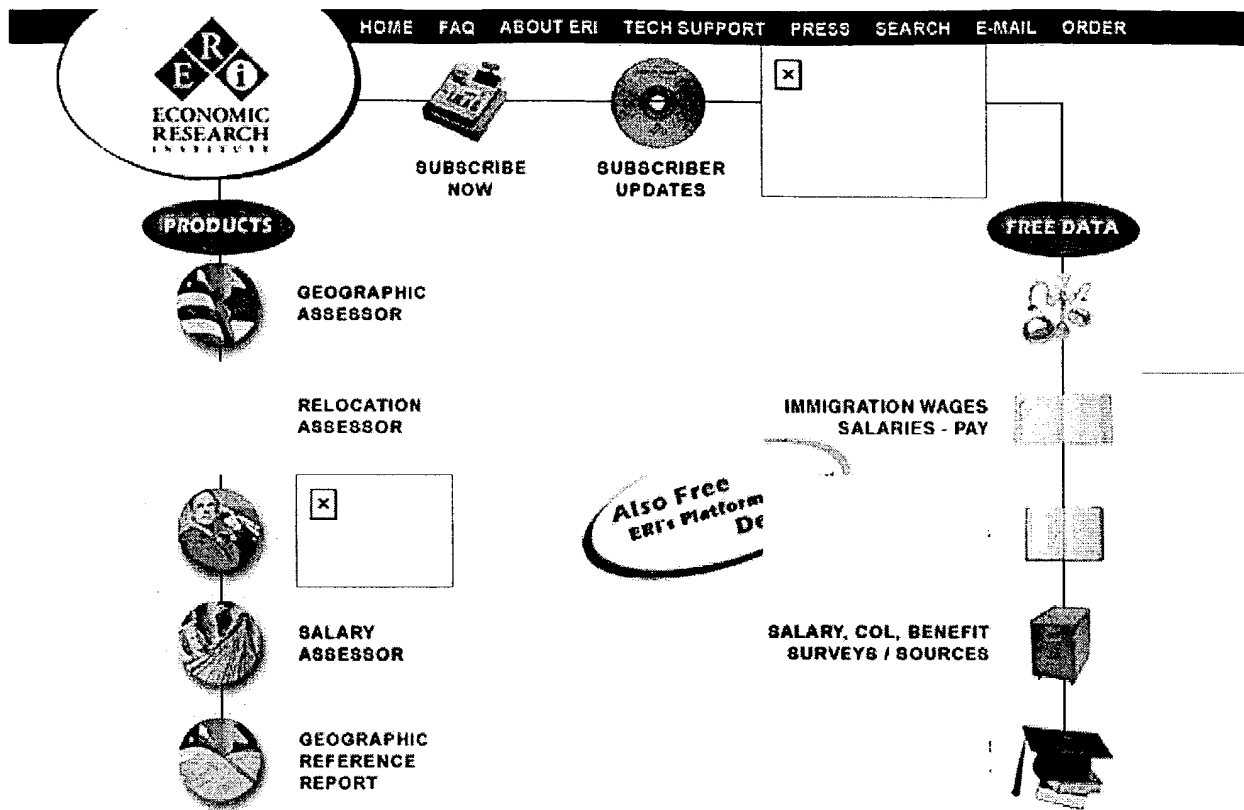
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<a href="#">Dec 12, 1998</a> *	<a href="#">Apr 29, 1999</a>	<a href="#">Mar 02, 2000</a> *	<a href="#">Feb 05, 2001</a>	<a href="#">May 28, 2002</a> *	<a href="#">Mar 24, 2003</a> *		
	<a href="#">May 08, 1999</a>	<a href="#">Mar 04, 2000</a> *	<a href="#">Feb 26, 2001</a>	<a href="#">Jun 02, 2002</a>	<a href="#">Mar 30, 2003</a>		
		<a href="#">May 19, 2000</a> *	<a href="#">Mar 01, 2001</a>	<a href="#">Jun 03, 2002</a>	<a href="#">Jun 02, 2003</a> *		
		<a href="#">May 26, 2000</a> *	<a href="#">Mar 02, 2001</a>	<a href="#">Aug 02, 2002</a>	<a href="#">Jun 11, 2003</a> *		
		<a href="#">Jun 19, 2000</a> *	<a href="#">Mar 31, 2001</a>	<a href="#">Sep 15, 2002</a> *	<a href="#">Jun 18, 2003</a> *		
		<a href="#">Jul 06, 2000</a> *	<a href="#">Apr 01, 2001</a>	<a href="#">Sep 22, 2002</a> *			
		<a href="#">Oct 19, 2000</a> *	<a href="#">Apr 10, 2001</a> *	<a href="#">Sep 24, 2002</a>			
			<a href="#">May 15, 2001</a> *	<a href="#">Sep 27, 2002</a>			
			<a href="#">May 29, 2001</a>	<a href="#">Oct 23, 2002</a> *			
			<a href="#">Jun 05, 2001</a>	<a href="#">Nov 23, 2002</a> *			
			<a href="#">Jun 13, 2001</a>	<a href="#">Nov 26, 2002</a> *			
			<a href="#">Jul 09, 2001</a> *	<a href="#">Nov 27, 2002</a>			
			<a href="#">Jul 20, 2001</a> *				
			<a href="#">Sep 17, 2001</a> *				
			<a href="#">Sep 26, 2001</a> *				

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ERI Economic Research Institute is a compensation and benefits research outsource. We offer research software and reports relating to area wage and salary differentials, salary survey position pay, area cost-of-living differentials, and other human resource and demographic information relating to employee pay.

ERI research data can provide you with answers to all manner of questions relating to salary survey, wage survey, salary comparisons, COL, and executive compensation salary comparisons.

Our salary research, wage comparisons and differentials, executive salary compensation survey data, research on relocation costs, economic research of salary survey and executive pay, benchmark analyses and analyses of salary data are used to set salary, wages, cost of relocations and to ascertain a relocation salary by over 5,000 corporate subscribers. Our new **Executive Compensation Assessor** replaces many executive compensation surveys; our economic research, as reported in the **Relocation Assessor**, creates indexes of cost of living and cost of relocations and employee transfers; our **Geographic Assessor** derives wage & salary geographic differentials; our **Salary Assessor** is used for market pricing, industry benchmark listings, salary planning, branch pay administration. **Geographic Reference** and **International Reference Reports** are available for those who wish only a hardcopy report.

Assessor Series and other described product and service offerings are void in all jurisdictions that do not honor all of the terms of any ERI offer. Offerings are also void in any Country, State, or Province in which ERI may not be properly licensed to transact business or solicit research subscriptions.



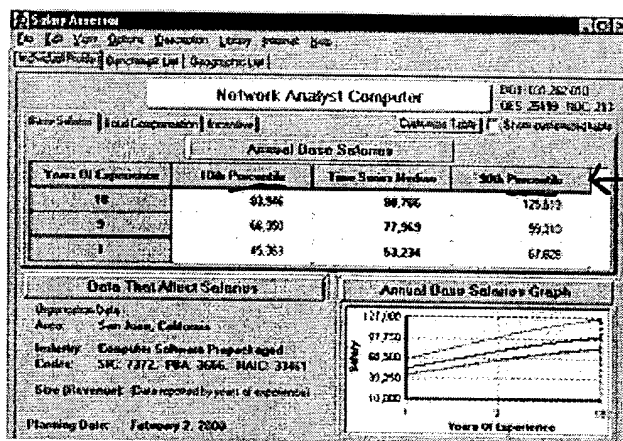
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ERI's Salary Assessor® for Windows is an easy-to-use software database which aids with the assessment of an organization's wage/salary competitiveness. Institute researchers save our subscribers time and expense by collecting and analyzing available surveys and presenting up-to-date, consensus results.

ERISA for Windows provides detailed median and mean pay range information for over 2,500 positions in 298 U.S. and Canadian metro areas (geographic area expanded to over 5,800 U.S. and Canadian cities and towns when used in conjunction with the Geographic Assessor®).



All Positions

All Positions

By Category

Middle Management

Supervisory Positions

Professional Positions

Information Tech Positions

Sales Positions

Health Care Positions

Technical Positions

Field / Shop / Clerical

Cities Included

Salary calculations are adjusted for user inputs of geographic area, industry, organization size, and salary planning date. ERISA assists precise evaluations of market pay and is the only source of its kind which reports data compiled from all available salary surveys. Job data is matched and reported according to job descriptions.

ERI wage and salary regression analysis results are derived from thousands of wage and salary surveys and sources. Institute databases are updated daily, and software quarterly updates are released in January, April, July, and October of each annual subscription year.

Tables are displayed and printed according to user specifications and may be ranked, sorted, saved, loaded, and written to printers or files. Default benchmark listings are available for jobs in major industries. Competitive base salary, incentive, and total compensation amounts are reported.

#### Tables present:

**Individual Profile:** Displays 3 columns of salary range data for 3 different years of experience and for salary range. The defaults for years of experience are entry, maturity maximum, and the midpoint of entry and maximum. Users may also select any years of experience within the total range. (See above screenshot)

**Benchmark Listing:** Enables user to enter and view up to 99 positions' mean salaries for one location at a time. This allows the user to view a listing of benchmark or key positions with ERI calculated salaries, and compare user current pay practices to local market pricing calculations. View Example Benchmark Listing.

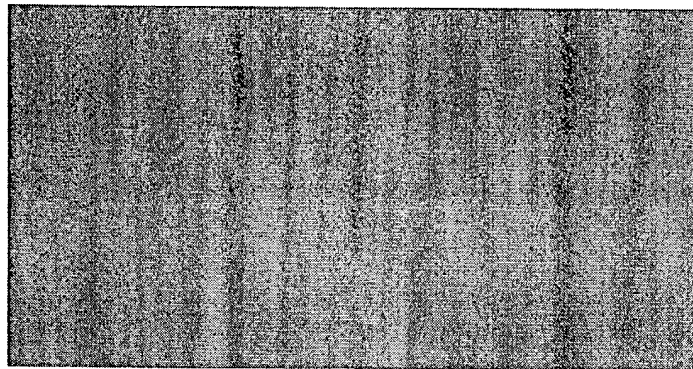
**Geographic Listing:** Enables user to enter and view up to 99 areas' mean or median salaries for one position at a time. On one table (or printout report), a user may view a listing of branch offices with ERI calculated salaries, and compare user's current pay practices to local market pricing. View Example Geographic Listing.

**System Requirements:** 1,300k hard disk space; 474k RAM

- Salary Assessor (Annual Subscription)  
ERISA \$689.00

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trial basis.

- Upgrade to the Full Analyst's Series (Annual  
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Full Analyst's Series \$1,767.00



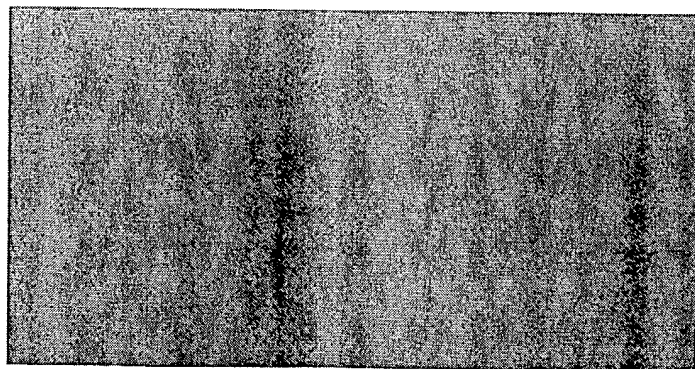


To assist with planning or auditing pay for multiple positions at one location, the Multiple Position Benchmark Listing table enables you to view up to 99 positions' mean salaries for one location at a time. (Click on the image to enlarge view)

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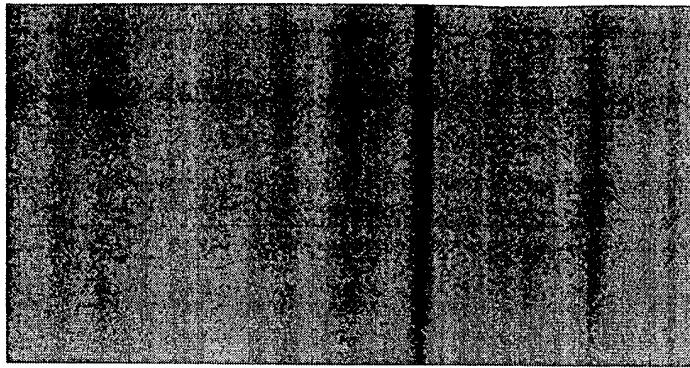


To assist with planning or auditing pay for one position in multiple (branch) locations, the multiple location Geographic Listing table enables you to enter and view up to 99 areas' mean or median salaries for 1 position. (Click on the image to enlarge view)

- 
- Salary Assessor (Annual Subscription)  
ERISA **\$689.00**

All ERI products  
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**Salary Survey Analyses**

ERI provides over 10,000 organizations with salary survey analyses, geographic differentials, wage surveys, executive compensation information, cost of living comparisons, prevailing wage studies, employee benefit data, and compensation and benefits training.

**"Plotted dots and  
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compensation an  
where you can at  
the data, includin  
proxies and 10-K  
never seen anyth  
that approaches  
Assessors!"**

**W.A. Caldwell**  
Former ACA Nati  
President

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Geographic Assessor® - Geographic Differential Data.

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Relocation Assessor® - Cost of Living Data.

Generate unlimited two-city cost of living reports for relocations with cost-of-living data covering 10,000 cities; includes income tax differences. Over 6,000 U.S. cities reported; often used to adjust salaries for transfer store managers, clergy, or consultants.

Geographic Reference Report - Hard Copy Report.

A hard copy report for 298 North American cities, showing a salary range for 88 benchmark jobs, cost-of-living levels, structures, health care costs, per diem rates, and demographic data.

ERI's enhanced Dictionary of Occupational Titles - eDOT.

ERI has updated the abandoned U.S. DOT. New job descriptions have evolved from ERI's analysis of thousands of salary surveys. Job analysis work fields, skills, MSPMS, and worker specific occupational characteristics including new stress measures, are added, updated, and/or enhanced for 14,000 position descriptions and 95,000 occupation titles.

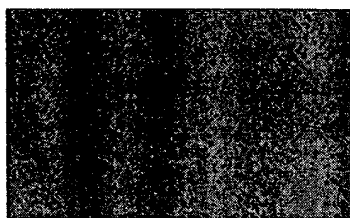
Corporate managers, over 80 percent of the U.S. Fortune 500 companies as well as federal and local courts and practicing consultants rely on ERI research products to set wages, salaries, cost-of-living allowances, and relocation bonuses. Visit the ERI Distance Learning Center with its free compensation and benefits administration courses designed to assist in training staff analysts or gain continuing education credit (PHR, SPHR, CPE, or CE).

ERI Economic Research Institute is a research outsource for wage and compensation information including salary survey data, executive compensation, cost of living, prevailing wage, and employee benefit data and job employer information. We are helping our subscribers who use ERI salary research data to set individual pay, establish wage structures, set branch office salary structures, determine relocation allowances, and train job analysts in salary administration. For more ERI data by downloading the full demo of ERI's Platform Library and Wizard. Learn more about ERI's Salary Survey Analyses.

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ERI Economic Research Institute was founded in 1987 to provide research for private and public organizations in the form of published reports and software database products. Revenues for the Institute are earned from these software and publication sales. ERI does not provide fee-for-service consulting; it serves solely as a compensation and benefits research outsource.

ERI's research database software applications are available on a subscription basis and are now widely used by client organizations (over 6,000 corporate subscribers). Subscribers include corporate compensation, relocation, human resource, and other professionals, as well as independent consultants, CPAs and counselors, and federal government organizations. ERI is an authorized research provider under the American Institute of Certified Accountants Affinity Provider Program.

ERI's founder first developed the concepts related to the use of simple linear regression models for area wage and salary differentials in 1974. (He was then the Manager of Compensation for a Fortune 200 Company. Later, he further developed early linear regression models at the Compensation Institute, a research firm acquired by Mercer in 1982.) ERI's present multiple regression techniques were developed in the late 1980s. Cost-of-living models originated in 1989 as the result of customer requests that ERI research and report area cost differentials in addition to wage differentials. (COL analyses were further in demand because the BLS had decided to discontinue its Urban Family of Four Index.) In 1992, ERI headquarters moved from California to Washington. Institute methodology has benefited greatly in recent years due to the refinement of analyses as well as the increasing availability of data relating to both wages and costs via the Internet.

ERI's research software database applications are available on an annual subscription basis. ERI's **Platform Library™**, a CD-ROM application, allows for easy installation of products and compliments the **Assessors** by providing complementary free data (maps, OES/DOT/SOC/NCS surveys, HR Tax Codes/Laws for 76 provinces/states and 210 countries, Census data, and access to historic 10-Ks, proxies, and Appraisal Norms). For subscribers, the **Platform** also serves as a "gateway" to additional free data available via the Internet. The **Assessor Series®** products include:

The **Geographic Assessor®** calculates salary and cost-of-living differentials between any of over 5,800+ U.S. and Canadian cities and neighborhoods. It can summarize both percentage and dollar differentials between any base city and up to 99 comparison cities at a time. **ERIGA** research focuses on the presentation of wage and salary structures for each geographic area based upon consensus regression analyses of salary surveys, and also incorporates summary cost-of-living data from the **Relocation Assessor®**.

The **Salary Assessor®** provides "consensus" wage and base salary (mean and median) ranges for 2,200+ different positions as compiled from available published survey sources. Estimates may be adjusted for user inputs of salary planning date, metro area, industry, and company size. **ERISA** includes position descriptions for job matching. Benchmark listings

for jobs by industry as well as multiple area listings for a single job in up to ninety-nine metro areas (with market-ratio calculations) are provided in summary listing screens.

The **Relocation Assessor®** provides cost-of-living comparisons and reports between any of 5,800+ U.S. and Canadian cities and neighborhoods and an additional 1,400+ international locations. **ERIRA** provides necessary information to determine the financial impact to an employee of a permanent transfer or to calculate temporary COL allowances. User inputs include: spending level; living areas; home rental or ownership (and mortgage specifications); home size; family size; and number of automobiles, miles driven, and combined value.

The **Executive Compensation Assessor™** provides analyses of proxy data for 131 top management positions as defined from over 10,000 companies per year, analyzed by organization size, geographic location, and industry. (Used in conjunction with **ERI's Platform Library**, subscribers may review actual proxy Summary Compensation Tables.)

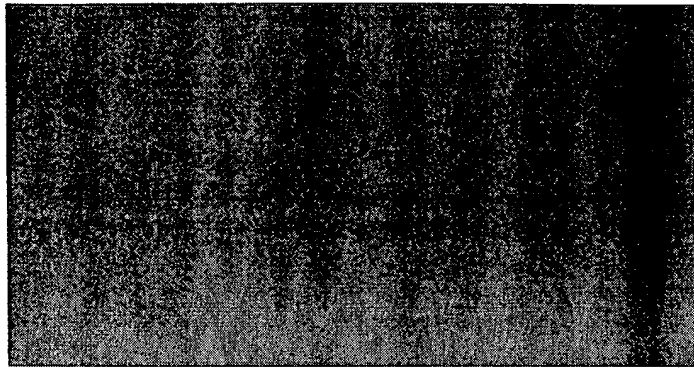
Canadian wage/salary and cost-of-living databases are researched and presented independently of U.S. levels. International data is reported in the currency of the specified country.

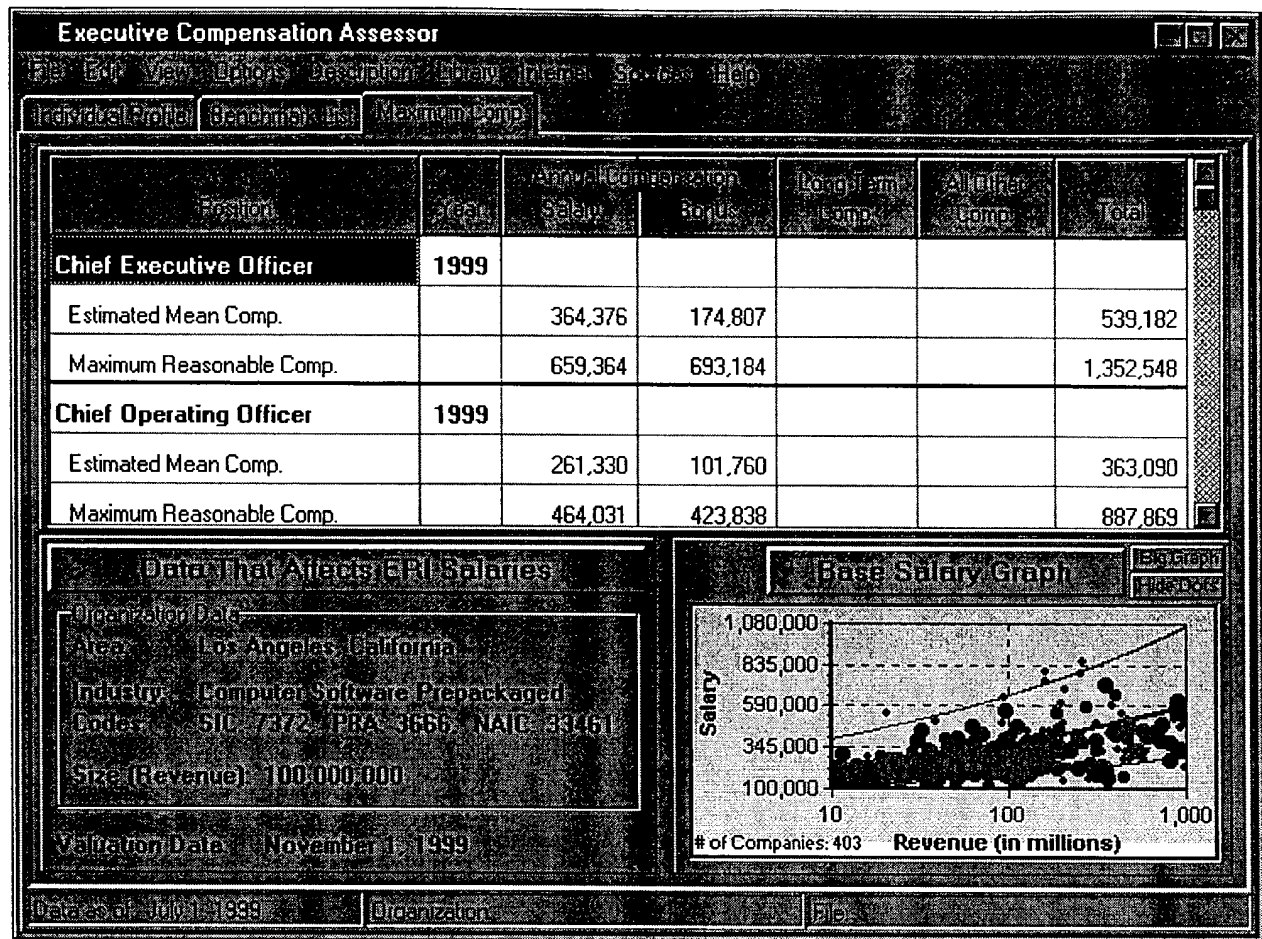
ERI's reference manuals, the Reference Report Series, are found in over 10,000 companies and libraries across North America today. The **Geographic Reference Report** profiles salary, costs, and demographic summaries for 298 major metropolitan areas in Canada and the United States. The **International Reference Report** profiles salary, costs, and demographic summaries for 210 countries and 346 major international metropolitan areas.

In 1998 **ERI** began development of online Internet based surveys to supplement its benefit, cost-of-living, and wage/salary data specifically for those international or rural locations where surveys have never (or not recently) sampled data. This WEB site is found at [www.salariesreview.com](http://www.salariesreview.com).

**ERI Economic Research Institute** primarily serves private industry. The public sector, IRS, and libraries comprise approximately 20% of our subscribers. Our salary structure analyses have been in use since 1974; the PC software to extract competitive wage and salary rates since 1987; and our COL analyses since 1989. **ERI** does not provide consulting services. We are a WOB, a small business corporation, privately held, EIN 33-0356443, Duns # 60977744, CAGE code OXP39. For further information, see [www.erieri.com](http://www.erieri.com).

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**Executive Compensation Assessor**

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Individual Profile Benchmark List View Compensation

	Position	ERI Projected Mean Annual Salary	Actual / Present Annual Salary	ERI Market Index
1	Chief Executive Officer	364,376	350,000	96.1
2	Executive Vice President	242,285	210,000	86.7
3	Chief Financial Officer	182,480	165,000	90.4
4	Marketing, Top Officer	141,080	112,000	79.4
5	Director, Advertising	71,029	54,000	76.0
6	Accounting Director	100,315	95,000	94.7

**Data That Affects ERI Salaries**

Organization Data:

Area: Los Angeles, California

Industry: Computer Software, Prepackaged

Codes: SIC: 7372 PBA: 3666 NAIC: 33461

Size (Revenue): 100,000,000

Planning Date: November 1, 1999

**Base Salary Graph**

Salary

Revenue (in millions)

Date as of: July 1, 1999 Organization File



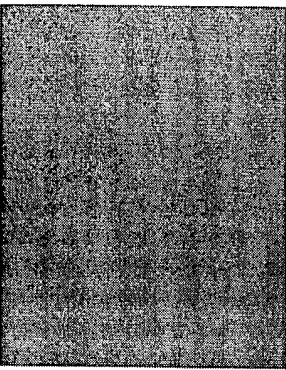


## Frequently Asked Questions

"Where do these numbers come from?"

"What exactly does the Institute do?"

"What is the value of the Institute's products to me?"



It is the Institute's goal to be your organization's compensation and benefits research "out source". That is, you should be able to duplicate the Institute's estimates should you desire to spend the time and resources required to collect, compile, and analyze the thousands of data points which comprise any one city's, position's, or cost category's regression structures. This time and these resources can now be spent by subscribers in applying the results of research in administering pay and performing the many other duties that modern H.R. administration demands. ERI's research analysts offer a combined one hundred-plus years of experience in the field of compensation and benefits. ERI maintains two major databases separately - one which tracks *wage and salary* information, the other *cost-of-living* information. Additionally, Canadian and international data are held apart from U.S.

If you need further assistance,  
please call ERI customer service  
at:

1-800-627-3697

### Regression

"Where do these numbers come from?"

"What is regression?"

The Institute collects survey data for jobs and costs by area (all surveys and databases available to our library) and evaluates each survey and source for validity, reliability, weighting, and use. Median and mean salaries for positions with similar duties, responsibilities, and functions are analyzed using "multiple linear regression analysis", and consensus results are presented to our subscribers for any given position, earnings or spending level, and/or area. Regression analysis involves the "measuring and accounting for" multiple variables which have proven to adequately predict results for both well and not-so-well surveyed positions, areas, earnings levels, or costs. A different regression model is used for each of the separate *cost-of-living* categories to predict the amount and movement of costs. Additionally, separate equations exist for each of the over 3,000 positions studied annually by ERI. Three equations exist for each geographic area studied, each derived from a combination of salary surveys.

### Wages and Salaries

"How does ERI data compare with your competitors'?"

ERI research staff know of no other combined source for wage and salary data. Individual surveys profile only a fraction of the combined data for any given **Assessor** position or area. There's no other easily accessed source of information about how much most jobs are paid. The alternative is to purchase myriads of industry-specific and area-specific surveys, along with informal survey research

and analyze each data source separately. This is what ERI does for you.

In a way, ERI has no competitors, although it does, in a way, "compete with itself". ERI's founder wrote and sold his first report on geographic pay differentials in 1974. That report (format and methodology) is now sold by ERI's major geographic wage differential competitor. Happily, this large national consulting firm has not changed its methodology since the 1970s and relies heavily on BLS data. ERI, in comparison, utilizes all publicly available salary surveys; constructs three regression lines to block out variances; models suburb pay; and allows subscribers to group labor markets. Alternative sources, who utilize only BLS surveys or only their own surveys are working with only a fraction of the data included in ERI analyses.

### Cost of Living

#### "Who uses Relocation Assessor data?"

Companies who transfer employees or individuals transferring between one area to another; also, organizations interested in automobile allowances (Fixed and Variable Rate Analyses) and CONUS per diems. Less than 2 % of ERI subscribers polled use *cost-of-living* differentials to adjust wage and salary structures.

#### "How does your data compare with your competitors' who send research teams into the field to collect data?"

We believe that ERI data is more robust. Downloaded data is more data than can be collected easily for individual comparisons. The real difference, however, is cost. One travelling research team in one city for one week requires \$~5,000 in expenses; multiply by 6,700 cities and that's \$~33 million in annual costs for each of ERI's competitors (which can't be the case). Competitors have to charge far more for their reports, because they continue to use this costly methodology of the 1940s. ERI collects data fairly inexpensively and passes those savings on to its subscribers. For \$689/year (annual subscription price), a subscriber can make millions of customized analyses and reports. Competitors charge up to \$325 per two-city analyses (and \$500 for international). Two of these competitors' two-city reports exceed the annual cost of a **Relocation Assessor** subscription.

#### "But isn't on-site collection more accurate?"

Not necessarily. ERI downloads actual housing sales data from commercially available sources and that's as "on-site" as our competitors' data. Gasoline, consumables, medical care premium costs, and effective income tax rates are as accurate, and ERI research staff audit these sources with special area research projects. Again, what distinguishes ERI from other *cost-of-living* sources is that we attempt to provide an affordable, in-house resource rather than an expensive consulting service. Many of our subscribers have need for both kinds of service.

#### "What's the difference between cost-of-living and wage & salary geographic differences?"

*Cost-of-living* reflects the difference between areas' housing, tax, consumable, transportation, and medical services costs. These reflect the "demand and supply" for goods and services. Wage & salary differentials reflect the "demand and supply" for labor. Geographic *cost-of-living* and wage comparisons are "apples and oranges" comparisons.

#### "When do I use wage/salary differentials and when should I use cost-of-

**living differentials?"**

*Wage and salary* differentials reflect the local demand and supply for labor. *Cost-of-living* is dictated by the local supply for goods and services. Most compensation professionals agree that when a company is hiring from the local workforce (that is, when no transfer or relocation occurs) wages and salaries should be set according to market pricing of wages and salaries only. *Branch pay should be dictated by market pricing of wage/salary differentials only.* While employees may find it more desirable for their pay to be adjusted for local cost-of-living variances, this is an extremely unusual practice, and in many cases will not be cost effective for the employer. That is, the employer would be competing against organizations with relatively lower compensation costs and thus, be at a competitive disadvantage.

In most cases, cost-of-living is considered only when an employee is moving internally, from one branch office to another or in the case of a "new hire" earning substantially more than "average". It is often preferable that the cost-of-living allowance be awarded separately from salary and for a finite period of time. It is often undesirable to build a cost-of-living adjustment into salary as the integrity of the current salary administration will be compromised. For instance, the transfer of personnel into an office where locally hired employees would be earning lower salaries than transferees is an undesirable and avoidable situation. Better solutions would include the award of a one-time (lump sum) moving bonus, a gradually decreasing three-year cost-of-living allowance, etc.

Random telephone calls by the Institute's Director have found that only 2% of ERI subscribers pay "the same for all jobs nationally, but vary levels by cost-of-living". (All other surveyed subscribers stated that they ignore cost-of-living and concentrate on the demand and supply/ market pricing for labor.) Examples of ERI subscribing organizations which do build cost-of-living differentials into their local pay structures include engineering firms, religious and non-profit organizations, and those few companies which administer only executive pay.

**"What is the background behind the Assessor's wage and salary structures?"**

Statistically, we smooth out survey variances by identifying survey data "breaks" at four earnings levels. ERI produces three regression analyses to protect against "outliers" between these points. Outliers are either very high or low paying jobs within a data population which do not reflect the common labor market. ERI's three structures correspond to the terms "*non-exempt*", "*exempt non-bonus*", and "*exempt bonus*" in the United States. In Canadian terms, there is no FLSA "*exempt*", and therefore the three structures correspond to "*wage earner*", "*mid-salary level earner*", and "*high salary earner level*".

**"How often is Assessor software released?"**

Survey sources are released at different dates throughout each year. ERI staff collect and analyze new data on a daily basis and trend individual survey effective dates to a common quarterly effective date. For this reason, we release quarterly updates, rather than publishing only one annual report. Our date and copyright protection on each diskette helps you to be sure that you are using the most current data available from ERI.

**"How is salary survey data weighted?"**

ERI evaluates each wage and salary survey individually (comparing survey results from year-to-year) and weighs survey data in our analyses according to survey

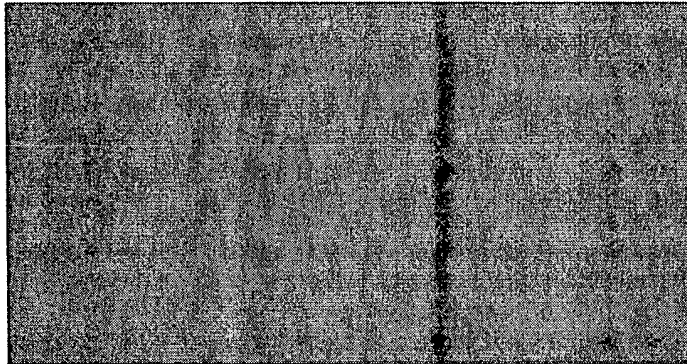
methodology, job matching, number of incumbents, area matching, ERI's confidence in each position in the survey, etc. Each city and each job is analyzed separately, and available survey data varies by area. There is a basic ERI methodology used to derive the 16,000+ structures, but each area and structure's individual methodology is dictated by the availability of survey data and ERI's specific methodology.

**"Who uses Geographic Assessor data?"**

Companies setting salary structures, who pay different rates in different parts of North America. Branch pay differentials allow you to take advantage of the differing labor markets to maximize profits and minimize operating costs. The rule of thumb when administering branch pay is to pay the minimum rate required to attract, retain, and motivate employees in each area.

**"Of what should we beware?"**

When comparing different sources of data, please be sure to confirm that: positions are matched (by description); area definitions are comparable (downtown vs. greater metro area vs. a grouping of suburbs); and the surveyed population is comparable (industry, company size, etc.).





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## Analysis of U.S. Dept. of Labor's Occupational Employment Statistics

### Methodology/Disclaimer Immigration Wage/Salary Trends ERI's Time Series of the Data reported in the Occupational Employment Statistics Salary Surveys

#### Use of This Data - Disclaimer

This data is provided "as-is" and ERI makes no warranty, either expressed or implied, including but not limited to, warranties of correctness and fitness for a particular purpose. In no event will ERI be liable for any indirect, special, consequential or other damages however caused. Data has been taken from datasets provided to ERI by the U.S. and Canadian Governments. In some cases, no published assignments of geographic areas exist (see Requested OES Area below); in other cases ERI has found data that appears to be incorrectly keyed. ERI presents a crosswalk among DOT, SOC, OES, and NOC code created from its best effort analyses of reported data; to ERI's knowledge, no Government published crosswalk exists between U.S. and Canadian jobs. ERI has no way to audit this data; it is republished as collected. U.S. raw data shown is non-copyrighted (as is all U.S. Government data), while Canada Census data (which is copyrighted) is shown with Statistics Canada's written permission.

#### OES Survey Job Class Description

Job Class as used by ERI denotes the fact that the Occupational Employment Statistics (OES) Salary Survey begins with the premise that it will include all workers in America and reflect all jobs and positions. ERI's definition of a "position" is that it is a specific job held by an individual with specific duties, objectives, and responsibilities. A "job" is a grouping similar positions, and a "job family" is a collection of jobs. The OES survey is best described as a collection of job families for higher levels (General Management), technical and professional positions, although it may actually represent a "position" with lower level responsibilities (such as word processor). The "Job Class" term is used to denote that the OES job definition will include many different types of positions and job titles, including in some cases, that job's first line supervisory counterpart and paraprofessional peers. It will often represent a collection of job families (some 820 in all). Canadian data is even more broadly grouped (into 47 occupational classifications); each Canadian occupational classification has been crosswalked to each OES job group.

#### Requested OES Area

Any one of 631 different OES areas covering all of the U.S. and its territories can be selected. OES Area names are those defined and used by the U.S. Government. They represent (in most cases) a collection of counties with the exception of Connecticut, New Hampshire, and Massachusetts where counties are divided. ERI apologizes for certain assignments within New England that may not agree with State officials as published data for New England is incomplete and ERI has made its best estimate of what city or town fit in which New England area. An example would be Wilmington, MA which is within 10 miles of downtown Lowell and which we had assigned to the Lowell OES area, only to recently find that more the more distant Boston OES area claimed this city. We will be improving our New England definitions as these area assignments becomes available to ERI. Canadian areas are those assigned by ERI utilizing the same methodology as found with U.S. data (adding 46 additional areas). These assignments and created "OES areas" were created solely by ERI with no input from Canada Statistics. In addition, ERI provides data

on a state, territory, and province summation basis with those areas' codes ending with zero digits.

### Time Series Projection

ERI calculates a linear regression line based upon up to three data points published by the Occupational Employment Statistics Salary Survey. ERI uses July median collection date for each of the 959 job classes and 820 job groups found in 631 geographic areas. (OES data is collected throughout the year and adjusted by BLS to a central date.) ERI assumes that the last day of each month is used and projects data to the first of the next month for any inquiry, using an equation in the form of:  $Y = a + b * X$ . This equation, established from the reported weighted average of each year, is used to project means for any month (defined as the same month as the inquiry with 1998 data being defined as  $1997 \times 12 + 6 = 23970$  for the "x axis" coordinate.) If data is present for one year and not for another or is of a different "type", ERI assumes the projected rate will not be less than the most recent value gathered by OES for that job. No other assumption or methodology is used on this non-copyrighted data. The OES survey is complicated and all-inclusive (attempting to collapse over 16,000 jobs, 30,000 position titles, and 1,000's of professions in the United States into ~960 broad job categories and 820 specific SOC/OES job groups). Users of this data are encouraged to read the methodology below (as found on the Government's Internet site) :

[http://web.archive.org/web/20010107183500/http://stats.bls.gov/oes/oes\\_tec.htm](http://web.archive.org/web/20010107183500/http://stats.bls.gov/oes/oes_tec.htm). ERI regresses only *like statistics* (area against area, state against state, see "Type" description below). We note that the high projections originally reported in 1997 and 1998 OES data are sometimes quite different from the 1999 data (data which will be used in the Year 2000). Canadian data is shown from both the 1991 and 1996 Census, with fields for the 2001 Census about to be completed. 1 January 1991 and 1996 are dates similar to those described for the OES data and equations (coordinate points are  $1990 \times 12$  and  $1995 \times 12$ ). Canada Statistics also supplied ERI with 1986 data. The classifications utilized were quite different and are not readily comparable. (This project/analysis will hopefully be completed before Canada Census 2001 data becomes available.

### Survey/Type

OES reports one of four levels of data: Level: 1 = MSA, PMSA, or Balance of State Area; 2 = Contiguous Areas; 3 = Statewide; 4 = U.S. Nationwide. Overall Mean is not usable for *certification purposes* per GA Letter 2-98; Level I Mean is the weighed average of the first 1/3 of survey sample; and Level II Mean is the weighted average of the remaining 2/3 (including all those positions that: "work with indirect supervision"). As of 1999, a separate database is provided by the OES for Researchers Employed by Colleges and Universities, College and University Operated Federally Funded Research and Development Centers, and Certain Research Agencies. (The data in this report are from the general OES database and not for Researchers.) Canadian data is reported by Level 1, 3, and/or 4 with data being available for most occupational classifications in almost every Census sub-division.

### Survey/Source Name

ERI's Immigration Wage/Salary Trends – OES Data Analysis of the Occupational Employment Statistics Survey ("OES") and Canada Census. ERI Economic Research Institute is a compensation and benefits research outsource. It provides research software and reports relating to area wage and salary differentials, salary survey position pay, area cost-of-living differentials, and other human resources and demographics information relating to pay and relocation planning. ERI research data provides answers to all manner of questions on market pricing, industry benchmark listings, employee transfers, salary planning, and branch pay administration. The OES survey is only one of over two thousand surveys analyzed annually by ERI in creating its **Assessor Series**. (Canadian Census data is not used by ERI in creating the Salary Assessor as it is: 1) too broad to be useful and 2) not part of our agreement with Statistics Canada.)

### Survey Data Publishers

ERI is neither the publisher nor the conductor of this survey. The publisher and collector of this data are the U.S. Department of Labor's Employment and Training Administration ("ETA"), the Bureau of Labor Statistics ("BLS"), and 54 State Employment Agencies ("SESAs"), all acting together to create consistent prevailing wage rates to be used as the wage component of the Bureau of Labor Statistics' expanded Occupational Employment Statistics ("OES") program. Canada data is reported as sent to ERI by Statistics Canada and is derived from Canada's 5 year census cycle.

### Data Projected/Trended to:

ERI assumes that the last day of each month is used and projects data one day short of the first of the next month for any inquiry, using an equation in the form of:  $y = a + bx$ . This equation, established from the reported weighted average of each year, is used to project means for any month. Its "x-axis" is defined as the same month as the inquiry, with 1998 data being defined as  $1997 \times 12 + 6 = 23970$  for the "x axis" coordinate. Similarly, the 1999 data (collected in 1997) was regressed against a 23982 value, and Year 2000 data (reflecting 1998 data) was regressed against 93994. The resulting equation is then applied. For example, a May 2001 date is defined as  $2001 \times 12 + 5$  or 24017. Value =  $a + b \times 24017$ . (Canadian 1991 and 1996 Census values are projected from an x-axis of  $1990 \times 12$  and  $1995 \times 12$ .)

### OES Job Reference Number

This is a 5 digit number assigned by OES to define the positions surveyed. For surveys conducted in the Year 2000 and thereafter (reported in the Year 2001), this number will change to comply with NAFTA, and the Standard Occupational Code "SOC" will be adopted. **ERI's Platform Library** contains a crosswalk to the 1999 Occupational Employment Statistics ("OES") survey code, the DOT, Canada's NOC, the U.S. Census number, and the new SOC. For government related applications, these codes, along with Service Contract Act ("SCA") and Davis Bacon Act ("DBA") codes can be very confusing: SCA uses a different coding than either DOT, OES, the U.S. Census or Canada. For example, a Computer Programmer in the DOT is 030-167.014. In the OES it is 25105, and in the SCA it is 03101. The new SOC will replace all these codes/numbers. For this report, however, only the OES numbers as used for the data representing 1996 - 2000 are shown. For a crosswalk to OES, NOC, SOC and approximately 20 other coding systems, see **ERI's Platform Library's** Sources and Xwalks.

### OES Area Reference Number

This is a six digit number. The first two digits represent the state (or territory) and the last two represent one of the 631 geographic areas that cover and include all areas within the United States and the 46 assigned Canadian areas. Metropolitan Statistical Areas are used, as are OES self-described areas such as "Northwest Washington", which includes a number of counties not already included in PMSAs and/or MSA. Except for the three New England states (which divide counties), all OES areas can be defined as a collection of counties and/or Canadian Census sub-divisions.

### Salary Survey Area

The collection of counties and/or sub-divisions are those found within a specified OES area. It is our understanding that Year 2000 data, as released, represents the same county/area collection as in 1999, with the exception of one Arizona county. All counties within the U.S. are accounted for within the 631 OES areas for the 1996 - 1999 data. Within Canada, ERI has used the 302 Census sub-divisions/counties that differ in type among Provinces and in number among the three Census datasets provided. (Census sub-divisions differ only slightly each five years.) Canadian counties (a term used in certain provinces) and sub-divisions are typically much larger in geographic area than U.S. counties.

### Job Titles Included

The titles shown are those understood by ERI to be found within the Job Class Description. Selecting any one of the underlined (blue) titles below takes one to SalariesReview.com fee-based report for the specified position. Double clicking on the active link/ titles will take one to this separate survey (not the OES) where base salary, incentive, total compensation and survey participant estimates may be found. If a position title is in blue and underlined sufficient sample sizes exist to report wage/salary data. If black and not linked/underlined sufficient sample sizes do not exist at this time in the SalariesReview.com U.S. and Canada Wage and Salary Survey.

### OES Survey Job Description

Survey Descriptions are those of the OES with additional inputting of qualifiers to illustrate when jobs include first-line supervision, paraprofessionals, etc. For a full listing of OES Numbers and Descriptions, see **ERI's Platform Library** CD-Rom. Canada Census data came without descriptions for the 47 broad occupational categories.

### Methodology/Description

As found in this prose.

### Report Date

Report Date is the date on which the Search Report is generated on the Internet.

### ERI's Platform Library

This CD-ROM demonstration was created originally as a Windows platform from which all **Assessor Series®** software might be more effectively run. (Execution and disk speeds are enhanced.) It includes 5 non-copyrighted datasets that can be useful in compensation and benefits management including: maps, NCS/DOT/OES/SOC data and crosswalks, HR tax codes and laws for 76 U.S. and Canadian states/provinces/territories, Census data, SEC 10-Ks, proxies, summary compensation tables, and appraisal norms, 1994 to the present. These data are free of charge; see: [www.eri.com/fastplat.cfm](http://www.eri.com/fastplat.cfm).

### Data as Reported

Each year ERI accesses the data files of the OES survey and extracts the reported means: Level I and Level II data for 631 geographic areas. These reflect all jobs and all geographic areas within the United States and its territories (629 areas in 1998). ERI has titled the "Year 2000" data as "Data to be Used in 2000" even though it was collected in 1997-1998 and labeled as "98" data by the OES. 1998 represents the first year of data reporting and many areas were reported as a "contiguous area" that may or may not be within the same State. These "contiguous areas" may change from year to year. To establish meaningful trend lines, ERI has selected to focus on the "1", "3", and "4" Types that are described below.

The definitions below are taken directly from General Administrative Letter No. 2-98, the Labor Department's Guidance on New Prevailing Wage Policies for immigration programs of October 31, 1997 as enhanced by GA Letter No. 1-00 of May 16, 2000. (We refer the reader to <http://web.archive.org/web/20010107183500/http://www.eri.com/doltrends/Galetter1-00.htm>.)

### Type

OES reports positions within an area as either "1" (local area in which individuals may commute), "2" (contiguous/adjacent area), "3" (state-wide) or "4" (national). ERI does not necessarily show all these values and in all cases converts data to annual compensation (by multiplying hourly rates x 2080 hours). Should an area show a "4" for data in 1998, a "2" for data in 1999, and a "1" for data in the Year



2000, only the latter would be used (and the equation would be a horizontal straight line).

- 1 = MSA, PMSA, or Balance of State Area  
(local area in which an individual may commute);
- 2 = Contiguous/Adjacent Areas;
- 3 = Statewide;
- 4 = U.S. Nationwide.

If no local area data existed before the most recent year, a horizontal equation is utilized. For example, the 1999 data is projected as unchanged in the Year 2000. Only "like areas" are trended (2 vs. 2, 3 vs. 3, 1 vs. 1, or 4 vs. 4). If the Government does not report local area data (a "1" in the most recent year), a trend line and its projection may not be reported.

### Annual Mean

The OES definition of a mean is very well defined for our purposes.

*Methodology in any type of survey must reflect the average (arithmetic mean) rate of wages, that is, the rate of wages to be determined, to the extent feasible, by adding the wages paid to workers similarly employed in the area of intended employment and dividing the total by the number of such workers. This will, by definition of the term arithmetic mean, usually require computing a weighted average.*

That said, we refer the interested reader to the concepts of winzorized means and hot decking as described in the Government's technical site:

[http://web.archive.org/web/20010107183500/http://stats.bls.gov/oes/oes\\_tec.htm](http://web.archive.org/web/20010107183500/http://stats.bls.gov/oes/oes_tec.htm)  
and as used in the OES survey. Canadian annual means are the earnings reports for those fully employed in that occupation.

### Level I

These are beginning level employees who have a basic understanding of the occupation through education or experience. They perform routine or moderately complex tasks that require limited exercise of judgment and provide experience at familiarization with the employer's methods, practices, and programs. They may assist staff performing tasks requiring skills equivalent to a Level II and may perform high level work for training and developmental purposes. These employees work under close supervision and receive specific instructions on required tasks and expected results. Work is closely monitored and previewed for accuracy. (Canadian Level I represent the average for the lowest earning census division reporting from among those fully employed within this occupation. Note: should there be only one census division in an assigned area, then Level I, Level and Annual Mean Earnings will be the same for this Canadian area.)

### Level II

These are fully competent employees who have sufficient experience in the occupation to plan and conduct work requiring judgment and the independent evaluation, selection, modification and application of standard procedures and techniques. Such employees use advanced skills and diversified knowledge to solve unusual and complex problems. They may supervise or provide direction to staff performing tasks requiring skills equivalent to a level I. These employees receive only technical guidance, and their work is reviewed for application of sound judgment and effectiveness in meeting the establishment's procedures and expectations.

If a baccalaureate degree is normally required for entry into the occupation, the wage rate for a job offer in that occupation requires a further advanced degree (Masters or Ph.D.) for workers performing tasks requiring skills at a level II. In this case, the requirement for advanced education substitutes for the skills required at level II. Where an advanced job degree is normally required for entry in the occupation, the wage rate for a job offer in that occupation shall be the rate for workers performing tasks requiring skills at a level I, unless there are other requirements contained in the job offer or components thereof which require skills that are at a level II. For example, a job opportunity for a librarian, an occupation for which a Master's degree is normally required for entry into the occupation, would generally be considered to require skills at a level I, unless other requirements in the job offer or components thereof require skills at a level II.

Where States licensure is required for an individual to independently perform all of the duties encompassed by the occupation, such workers shall be considered to be performing work requiring skills at a level II, unless the employer can present sufficient evidence that the alien does not, in fact, independently perform all of the duties encompassed by the occupation.

In practical terms, if an employee utilizes any discretion or works with any freedom of action, it is most likely a Level II position. We refer the reader to <http://www.eri.com/doltrends/GAletter2-98> and <http://web.archive.org/web/20010107183500/http://www.eri.com/doltrends/GAletter1-00.htm>. The overall Mean is not usable for certification purposes per GA Letter 2-98; Level I Mean is the weighed average of the first 1/3 of survey sample. Level II Mean is the weighted average of the remaining 2/3 (including all those positions that: "work with indirect supervision"). Canadian Level II earnings are the highest reported average for any one census sub-division within the assigned "OES" area.

### Sample Size

At this time, OES does not "directly" publish the sample size of its survey, neither incumbents represented nor firms surveyed. To complete this analysis, ERI has had to estimate the number of incumbents from reported "all-over" state accumulations. One of the reasons for not reporting the number of incumbents measured (in ERI's opinion) is that the State Labor Departments (which have a funding related, OMB- BLS goal of an 80% response rate from all mailed OES survey questionnaires) have been given guidance on "mean imputation" and "nearest neighbor hot decking".

To explain, the OES survey consists of both head count and salary data collection. When wage data is missing and head counts exist, missing data is "imputed" (from national distributions). When head counts are not reported, but wage data exists, "hot decking" is used. The closest comparable company ("donor") is selected and then that donor's wage data is used. When both total employment and wage-employment data are missing, both hot decking and imputation are used.

ERI understands, with an 80% participation goal, why *imputation* and *hot decking* have been adopted and why sample sizes are not being reported. When this survey is mature, we would expect that mean imputation and hot decking will diminish and perhaps the population sizes will be reported.

In the interim, OES does report populations by job group class for each of the states and territories. Using ERI's **Geographic Assessor's** population statistics (collected in most part from the U.S. Census), ERI distributes the job class population for a state proportionately throughout the state based upon the population sums of the counties and cities represented. For example, Little Rock, Arkansas' OES area represents 4 of the most highly populated counties within the state. Consequently over 50% of the incumbents for job classes might be distributed within those four counties. Contrarily, Canadian Census data was provided to ERI with the populations measured (in a 20% sampling technique) reported by occupational classification and Census sub-division. In these cases, the value

shown are a summation of the sub-divisions found within an ERI derived Canadian "OES area".

One final note: The OES survey recently broke apart the industries reporting and designated a special industry grouping. As of 1999, a separate database was provided by OES for Researchers Employed by Colleges and Universities, College and University Operated Federally Funded Research and Development Centers, and Certain Research Agencies. Data from these separate 1999 and 2000 OES database are not included in EI surveys.

### Reliability Statistics - A Note for Expert Witnesses

In 1975, the U.S. Congress passed Federal Rule of Evidence 702 so that a threshold standard for the admission of expert witness testimony might exist in Federal Courts. Based on the concept that experts should use methodologies that are "generally accepted by a discipline's practitioners, the rule states: "If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise." Following this, the Supreme Court issued an opinion in *Daubert v. Merrill-Dow Pharmaceuticals*, 509 U.S. 57 113 S. Ct. 2786, 125 L.Ed.2d 469 (1993) that has become the standard for the admission "general acceptance". In this Case (which standard is now adopted by Federal and most State Courts), the admittance of expert witness testimony and evidence required a two-step analysis: A) Evidence must be relevant, and B) Evidence must be reliable. The "relevance is a subjective judgment but simple logic may be applied (salary survey data for use in los wage analyses, proxy compensation data for use in maximum reasonable compensation cases, etc.) For the latter, "reliability", the Supreme Court established four separate, non-exclusive tests: 1) it can be illustrated that the theory or technique can be tested, 2) the data has been subjected to peer review and publication, 3) there is a known or potential rate of error, and (4) there a level of general acceptance in that particular discipline's community.

In March of 1999 the United States Supreme Court issued a ruling in the *Carmichael* case that further defined when a *Daubert* reliability challenge applies. In *Carmichael*, the Supreme Court ruled that reliability must be established in all types of expert testimony, both scientific and non-scientific/technical. The Court held that the role of a trial judge was that of "gatekeeper" regarding both the relevance and reliability of all expert testimony. The Court stated that the *Daubert* case was not intended to be limited to scientific cases only. Instead, it would/should apply to all fields of expert testimony. Providers of expert witness testimony must be prepared to describe why an analysis was utilized and why the analysis and data can be considered reliably sufficient. (For further discussion, see: <http://web.archive.org/web/20010107183500/http://www.interfire.com/features/daubert.htm>

To assist subscribers in attesting to the "reliability" of data, ERI is at a disadvantage because its **Assessor Series** data projections are most often the combinations of many surveys and sources, many of which are copyrighted and licensed for confidentiality. Oftentimes ERI finds that over a hundred surveys contribute to an analysis, making our data very "robust". As the sample size increases the reliability of the data predicted becomes greater. However, for this Immigration pay analysis site, two sources may be cited, each a single survey: 1) the OES survey representing all jobs and areas in the U.S. and the official "head count" of those working in America and 2) Statistics Canada Census data which, like the U.S. Government's OES survey, represents "Broad Classifications for jobs (820 and 47 respectfully). Canada Census data is copyrighted and provided under contract to ERI for use with its free Immigration Pay Internet site found at <http://web.archive.org/web/20010107183500/http://www.eri.com/>. The Standard Errors and populations can be presented for these data. It is ERI's observation that by adding 2, 10, 100 (and in some cases 1,000) additional survey sources, one should only increase the reliability. Consequently, the numbers shown in the Reliability Statistics should be considered to be the minimum that exist within ERI's **Salary Assessor**. For this Internet

site's presentation, however, the standard errors shown are those taken directly from OES published data; see

[http://web.archive.org/web/20010107183500/http://edc.dws.state.ut.us/oes\\_data.htm](http://web.archive.org/web/20010107183500/http://edc.dws.state.ut.us/oes_data.htm). A request for Canadian Census standard errors has been made and may be soon forthcoming. (If no standard error is available, ERI's dataset defaults to 00.00, 15.00, or 22.00%. Users should disregard these preliminary numbers.)

### Calculation of Populations and Standard Errors

The OES survey reports three data points for each of 820 jobs in 631 geographic areas. Level I, Level II, and Average earnings can be used to create a fourth point. (One knows that Level I represents the 16.5<sup>th</sup> percentile. Level II represents the 66.5<sup>th</sup> percentile. The sum, plus a 4<sup>th</sup> point, should average to that reported for the job class.)

State populations are reported for all classes (see:

<http://web.archive.org/web/20010107183500/http://www.bls.gov/oes/state/oessrch2.htm>) and divided among the various counties for each of the OES geographic areas. A population for each area (assuming an equal distribution within a state) may be assumed. Thus, data points for a known number of incumbents may be constructed for the calculation of both correlation and standard error. Likewise, Canada Census data, representing 47 broad occupational classifications, were analyzed within ERI defined "OES like areas". Level I and Level II data points were defined as the high and low averages found within census sub-divisions for the "full time employed".

ERI presents this reconstructed distribution and analysis with the knowledge that its reconstruction exactly matches the distribution (as no other equation may explain these four points and population). BLS -OES - ETA do not publish the results for each specific OES area; data is published on a state and territory basis. Likewise, the identification of high and low earning Census sub-divisions reflects the distributions that exist. (ERI assumes that its calculated Standard Errors will also match the general population because of the Central Limit Theorem.) Being that each area's Immigration Analyses positions represent Job Group Classes, as compared to the **Salary Assessor's** defined Positions, these occupational job classes have higher populations. One should expect that they will represent only modest reliability statistics because of the variance caused by their collections of diverse and numerous different paying positions. The **Salary Assessor's** Reliability Statistics, by logic, are far more "robust" than that shown (in that OES is just one survey utilized).

\*Full U.S. OES datasets for the 1998, 1999, and 2000 years are found under the Demographic Data button on **ERI's Platform Library** so that peers may duplicate the statistics show. Canada Census data would have to be provided by Statistics Canada directly, as ERI has no right to share or show these datasets. (The only time one views actual data provided by Statistics Canada is when an "OES" area is comprised of only one Census sub-division.)

In mid 2000, ERI began to report a Standard Error from the report page for each data presentation:

SYZ Position	
Statistics	Reliability
Data: plus Bonus)	Total Compensation (Base Salary
City:	Costa Mesa
Area:	Orange County
Survey: 2000	OES Data Years 1998, 1999, and Canada Census 1991 and 1996

Observations	1,200
Standard Error	2.3% (As reported)
Sources:	OES - ETA - BLS and State
Agencies	Statistics Canada Census 1986, 1991, 1996
See Methodology	

## Reliability Statistics Definitions

### Data

Values include incentives (see full definition above and below).

### City

Populations of employees in a job group are defined across a wide geographic area. OES reported populations are for areas from which workers may commute and typically represent much larger areas, according to the OES, than a city metropolitan area. Canadian estimates reflect a minimum of at least one census sub-division (which are, on average, much larger than any single U.S. county).

### Area

These are as defined by OES; ERI divides Canada geographically using the same methodology by which BLS/ETA defines U.S. areas.

### Survey

At the time of writing this Methodology, three complete years of OES datasets and three complete Canadian Census datasets have been analyzed (1998, 1999, 2001 and 1986, 1991, 1996 respectively). Only the Canadian 1986 Census is not included.

### Observations

OES reported job survey populations are for areas from which workers may commute and typically represent much larger areas than a city metropolitan area. As mentioned, Canadian observations reflect a minimum of at least one census sub-division. The latter population is the sum from the 1996 Census for this job class; the OES is the prorated percentage applied to the populations from <http://www.bls.gov/oes/state/oessrch2.htm>.

### Standard Error

ERI considers two different types of simple standard errors that exist among the surveys analyzed. The first is the variance found for the same job across 677 "OES" areas, representing 303 Canadian Census datasets and 3,455 U.S. state and county areas. The second is the 820 and 47 different job classes as found within any one area. Both of these standard errors illustrate a fairly wide range (see: ERI's Comments Regarding OES reported Standard Error below). A third standard error measure exists, that reported by the U.S. Government on its Internet, the "Relative Standard Error".

Early in the 2000 Year, the OES began to report "Relative Standard Error" (RSE). To explain, the particular sample used in the OES survey is one of a large number of all possible samples of the same size that could have been selected using the same sample design. To quote the OES Technical Notes:

"Estimates derived from different samples would differ from each other. The variance of a survey estimate is a measure of the variation among the estimate from all possible samples. The standard error of a survey estimate is the square

root of its variance; the relative standard error is the ratio of the standard error to the estimate itself. The sample estimate and its standard error allowed OES to construct an interval estimate with a prescribed level of confidence that the interval will include the mean value of the estimates from all possible samples.

To illustrate, if all possible samples were selected, and if each of these were surveyed under essentially the same conditions, and an estimate and its estimated sampling error were calculated from each sample, then approximately 90 percent of the intervals from 1.6 standard errors below to 1.6 standard errors above the derived estimate would include the average value of the estimates from all possible samples. This interval is called a 90-percent confidence interval.

Approximately 95 percent of the intervals from two standard errors below to two standard errors above the derived estimate would include the average value of the estimates from all possible samples. This interval is called a 95-percent confidence interval. For example, suppose that an estimated occupational employment total is 5,000 with an associated relative standard error of two percent. Based on this data, the standard error of the estimate is 100 ( $= 5,000 \times 0.02$ ) and the 95-percent confidence interval for the estimate is  $(5,000 - 200)$  to  $(5,000 + 200)$  (4,800 to 5,200). This confidence interval is one of many that could be constructed based on the same sample design. Approximately 95 percent of these confidence intervals would encompass the average value of the estimate from all possible samples."

The Relative Standard Errors shown are those reported by the OES for the job groups in each state or territory. While ERI distributes populations so that one might review the probable populations within an OES area for a particular job group, it illustrates the same Standard Error for the same job group in all OES areas within a state. (One should be able to sum all the populations within a state and see a number equal to the state population reported. The Standard Error reported would be the same for all the sub group OES areas within that state. For Canadian data, ERI has no source from which to make an estimate (no Standard Error was supplied with the three Census Years of data and values are typically shown as 0.00%). Standard errors shown are ERI estimates. ("Default fields" illustrating that these calculations have not yet been finalized are indicated as 00.00, 15.00, and/or 22.00. Users should disregard these preliminary numbers.)

#### Sources

Only the before mentioned OES and Canada Statistics data have been used to create the values shown. Should Reliability Statistics be illustrated for areas in which there exists no predicted population, it will be because that value applies to the state/territory totals.

#### **ERI Comments Regarding OES Reported Standard Error**

Few collected salary surveys report standard error. Since the inception of **Geographic Assessor** analyses techniques (1974), however, we have calculated a "predicted" standard error for use with all our analyses and specifically now in the **Salary Assessor**. ERI has done this for "internal reasons", as salary range distributions and seniority curve distributions utilize this measure. ERI has not reported this number because of its 6,000 subscribers, 5,900 most likely don't utilize this measure in any way. Second, if ever challenged in a Court of Law, ERI researchers would admit that they have not had access to the actual data reported upon by the various surveys and hence, cannot separate out the "double counting" that occurs when one company reports its data to more than one survey (used by ERI). Finally, when ERI enters and analyzes data, it never replicates the actual numbers reported by any survey (all entries are rounded) so that copyright violations do not occur. Should a survey report a standard error (not a typical survey practice for a rank and file survey), ERI has no right to report it in any of its research products.

The OES survey changes this, in that its data is non-copyrighted. This is new as of 2000. Also new is ERI's own Internet based surveys found at <http://web.archive.org/web/20010107183500/http://www.salariesreview.com/>. These numbers (made up in part of OES seeded data and data collected from Internet respondents) are available to be reported. Finally, for management positions, the **Executive Compensation Assessor** (a sub-program found in the **Consultant's Assessor**) is the largest "survey" ever reported for executive pay, dwarfing all competitors by a magnitude of 100 times. ERI can report these numbers. That being said, for the top six executive positions, ERI would expect a standard error of +/- 30%, as management pay varies widely because of factors such as organization size, location, industry, and profitability. Readers should carefully review the results reported by the BLS and OES for management codes (and all other job groups). For example:

St	OES #	RSE
70	19002	2.0 %
70	19005	0.3 %
70	19999	0.4 %

are numbers that defy imagination (19005 are the top executive positions).

That is, these results are not a distribution standard error. They are what the U.S. DOL terms a "relative standard error". We understand that a low 0.3% "relative standard error" rather than the expected 30.0%, can be reported if a survey questionnaire records all salaries greater than \$60.00 an hour as \$60.01 an hour. (If all executives measured earned more than \$60.00 an hour, one would have a standard error of 0.0%. The OES Survey Questionnaire is a "check box" type that records head counts for those who earn more than \$60 an hour.) This, however, is only part of the explanation as all job grouping report a very low standard error. As ERI more fully understands the derivations of these numbers, we will update this Methodology.

### Data Plots

Data plots are under development for this site. The "plot of dots" found in the **Geographic Assessor** are actual reported OES survey results with that area's position's compensation compared to the U.S. National compensation. The plot of "dots" found in the **Salary Assessor** are an estimated distribution utilizing a random number generator to create a distribution representing the calculated population, correlation, and standard error. ERI can attest that the displayed measures do not exist in reality, but rather represent a model of what most likely exists. The plot of "dots" found in the **Executive Compensation Assessor** are, like the **Geographic Assessor**, actual data plots as derived from proxy compensation extracts. Running a PC's mouse's pointer over a dot identifies the values, double clicking pulls up the Summary Compensation table. Retrieval of the Full Proxy and 10-K will allow peers to reproduce that part of the ERI analyses.

"Dots" and "plots" are not shown at this time on the Internet site, as the time required to calculate and communicate these values is excessive for most subscribers. ERI refers the reader to the full ascii listing of all OES survey results for use in the Years 1998, 1999, and 2000, as found in **ERI's Platform Library**. For a view of the scatter diagram, use ERI's **Geographic Assessor**.

### ERI Statement as to the Relevance and Reliability of Data

Relevance is totally determinable by the circumstances and situation presented. ERI provides outsourced analyses and presentations of salary, executive compensation, benefit, and cost of living survey data. (See this Methodology's Disclaimer.)

Reliability is described in a four part, non-exclusive summary to match the *Daubert* challenge:

#### Theory/Technique Demonstrations

Methodologies accompany each **Assessor Series**, each [SalariesReview.com](http://www.salariesreview.com)

survey, and ERI's Internet presentation of OES and Canadian Census salary data used for immigration purposes as found at [www.eri.com](http://www.eri.com). These methodologies include definitions of terms, examples of calculations, and identifications of source and data updates.

#### **Subject to Publication and Peer Review**

**Assessor Series, SalariesReview.com** surveys, and ERI's Internet presentation of OES and Canadian Census salary data used for immigration purposes are constantly published and updated. The former is published on a quarterly basis, and the latter two daily. Internet visits now exceed 100,000 a month to both <http://web.archive.org/web/20010107183500/http://www.eri.com/> and <http://web.archive.org/web/20010107183500/http://www.salariesreview.com/>. The "doltrends" site is one of ERI's most popular.

ERI's "peers" are its competitors, those firms that also provide data analyses to their clients. Unlike ERI, which solicits an annual subscription, most compensation and benefit consulting firms charge an hourly rate for their research services. Suffice it to say, in the Year 2000, the following major consulting firms purchased LAN and multiple subscriptions so that their consultants could utilize ERI analyses: William M. Mercer, Hewitt Associates, Towers Perrin, Watson Wyatt, the Hay Group, KPMG, Baker Thomsen Associates, Arthur Andersen, PriceWaterhouseCoopers, Ernst & Young, and Deloitte. ERI data is used by these firms in their consulting for their clients. ERI data and analyses are under constant review and critique by its competitors. ERI, unlike these firms, provides no fee-for-service/time consulting.

#### **Known or Potential Rate of Error**

Each ERI **Assessor Series**, each **SalariesReview.com** survey, and ERI's Internet presentation of OES and Canadian Census salary data used for immigration purposes illustrate, via a "Reliability Statistics" link (see View | Reliability Statistics on each **Assessor**), the beginning of a statistical overview of ERI data. Statistics are reported as derived from just one survey source for all salary and compensation presentations (so that copyright restrictions are not violated). ERI accumulates many survey sources to compile its analyses. Hence the data illustrated may be, in ERI's estimate, considered to be the highest possible error and the lowest correlation that might exist with each analyses. **Assessor** data results are, by logic, more robust than the standard error displayed for this Immigration Wage/Salary Trends site.

#### **General Level of Acceptance within the Discipline's Community**

6,000 subscribers send money each year to purchase their subscriptions to ERI analyses. Each year over 80% renew their subscriptions, with many major corporations now in their second decade of subscribing. Special extracts of ERI databases are purchased annually by large organizations such as the International Churches of Christ, the Latter Day Saints, ACT, and Federal Express. U.S. Internal Revenue District Offices subscribe, as does the IRS National Appraisal Services Office (with a subscription now renewed into its second decade). ERI exhibits at major tradeshows (ACA/WaW, AILA, SHRM, ERC, AICPA, ASA, and others). ERI is one of fourteen organizations selected as an Affinity Program Provider by the American Institute of Certified Public Accountants and has the right to utilize the AICPA logo on all its research products.

### **Technical Notes - Occupational Employment Statistics**

[http://web.archive.org/web/20010107183500/http://stats.bls.gov/oes/oes\\_tec.htm](http://web.archive.org/web/20010107183500/http://stats.bls.gov/oes/oes_tec.htm)

#### **Employment Estimates**

Employment represents the estimate of total wage and salary employment in an occupation



across the industries in which it was reported. The OES survey form sent to an establishment contains between 50 and 225 OES occupations. The number of occupation listed on a form depends on the industry classification and size class of the sampled establishments. To reduce paperwork and respondent burden, no survey form contains every OES occupation.

### **Wage Estimates**

Wages for the OES survey are straight-time, gross pay, exclusive of premium pay. Include are base rate, cost-of-living allowances, guaranteed pay, hazardous-duty pay, incentive pay including commissions and production bonuses, and on-call pay. Excluded are back pay, jury duty pay, overtime pay, severance pay, shift differentials, non-production bonuses, and tuition reimbursements.

### **Mean Annual Wage**

Most employees are paid at an hourly rate by their employers and may work less than or more than 40 hours per week. The annual wage estimates in this release are calculated by multiplying the mean wage by a "year-round, full-time" hours figure of 2,080 hours per year (52 weeks by 40 hours). Thus, the annual wage estimates may not represent the actual annual pay received by the employee. There are a small number of occupations where on an annual wage figure is provided. The workers in these occupations are paid based on an annual amount, but generally work less than the usual 2,080 hours per year. Since the survey does not collect the actual hours worked, the hourly rate cannot be calculated with reasonable degree of confidence from the annual wages. For this reason, only the annual salary is reported for these occupations. Occupations that typically have a work-year of less than 2,080 hours include musical and entertainment occupations, flight attendants, pilots, and teachers.

### **Mean Hourly Wage**

The Mean hourly wage is the estimated total wages for an occupation divided by its weighted survey employment.

### **Median Hourly Wage**

Median hourly wage is the estimated 50th percentile of the distribution of wages; 50 percent of workers in an occupation earn wages below, and 50 percent earn wages above the median wage.

## **Survey Method and Reliability Statement OES Survey All-Industry Wage Rate Estimates**

### **General**

The Occupational Employment Statistics (OES) survey is an annual mail survey measuring occupational employment and wage rates by industry for wage and salary workers in non farm establishments. The survey samples approximately 400,000 establishments per year taking 3 years to fully collect the sample of 1.2 million establishments. BLS and the Employment and Training Administration (ETA) provide the funding for the survey. BLS provides the procedures and technical support, while the State Employment Security Agencies ("SESAs") collect the data. The SESAs produce occupational estimates by detailed industries for local areas and the states. BLS produces similar industry-specific estimates for the nation as well as employment and wage estimates for 750 occupations (although ERI counts 959 job class definitions within the OES description file) across all industries for the nation, each of the 50 states plus the District of Columbia, and Metropolitan Statistical Areas (MSAs).

### **Survey Definitions and Concepts**

Many of the concepts and definitions used in the OES Survey are comparable to those in the Current Employment Statistics survey, a monthly BLS payroll survey of nonagricultural establishments. Many others, however, are unique to this survey. Key definitions are as follows:

An *establishment* is an economic unit, such as a factory, mine, or store, which produces goods or services. It is generally at a single location and engaged predominantly in one economic activity.

The OES survey defines *employment* as the number of workers who can be classified as full-time or part-time employees; workers on paid vacations or other types of leave; workers on unpaid short-term absences; salaried officers, executives, and staff members of incorporated firms; employees temporarily assigned to other units; and employees for whom the reporting unit is their permanent duty station regardless of whether that unit prepares their paycheck. The survey excludes the self-employed, owners/partners of unincorporated firms, and unpaid family workers. Employees are reported in the occupation in which they are working, not necessarily for which they were trained.

*Employment* represents the estimate of total wage and salary employment in an occupation across the industries in which it was reported. The OES survey form sent to an establishment contains between 50 and 225 OES occupations. The number of occupations listed on a form depends on the industry classification and size class of the sampled establishments. To reduce paperwork and respondent burden, no survey form contains every OES occupation.

The OES classification system uses seven *occupational divisions* to categorize workers in one of 750 (or 959 according to ERI's count) detailed occupations. The seven divisions are as follows:

Managerial and Administrative;  
Professional, Paraprofessional, and Technical;  
Sales and Related;  
Clerical and Administrative Support;  
Service;  
Agricultural, Forestry, and Fishing; and  
Production, Construction, Operating, Maintenance, and Material Handling.

*Wages* for the OES survey are straight-time, gross pay, exclusive of premium pay. Included are base rate, cost-of-living allowances, guaranteed pay, hazardous-duty pay, incentive pay, including commissions and production bonuses, and on-call pay. Excluded are back pay, jury duty pay, overtime pay, severance pay, shift differentials, non-production bonuses, and tuition reimbursements.

The OES survey collects wage data in 11 intervals. Employers report the number of employees in an occupation per each wage range. The wage intervals (for 1998) were as follows:

Interval	Hourly Wages	Annual Wages
Range A	Under \$5.75	Under \$11,960
Range B	\$5.75 to \$8.49	\$11,960 to \$17,659
Range C	\$8.50 to \$9.99	\$17,660 to \$20,779
Range D	\$10.00 to \$11.24	\$20,780 to \$23,399
Range E	\$11.25 to \$13.24	\$23,400 to \$27,559
Range F	\$13.25 to \$15.74	\$27,560 to \$32,759
Range G	\$15.75 to \$19.24	\$32,760 to \$40,039
Range H	\$19.25 to \$24.24	\$40,040 to \$50,439
Range I	\$24.25 to \$43.24	\$50,440 to \$89,959
Range J	\$43.25 to \$60.00	\$89,960 to \$124,820

Range K	\$60.01 and over	\$124,821 and over
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These wage intervals change slightly each year, and in the Year 2000, new intervals/Ranges will be added at both the top and the bottom of the overall range.

**Annual wage:** Most employees are paid at an hourly rate by their employers and may work less than or more than 40 hours per week. The annual wage estimates in this release are calculated by multiplying the mean wage by a "year-round, full-time" hours figure of 2,080 hours per year (52 weeks by 40 hours). Thus, the annual wage estimates may not represent the actual annual pay received by the employee. There are a small number of occupations where only an annual wage figure is provided. The workers in these occupations are paid based on an annual amount, but generally work less than the usual 2,080 hours per year. Since the survey does not collect the actual hours worked, the hourly rate cannot be calculated with a reasonable degree of confidence from the annual wages. For this reason, only the annual salary is reported for these occupations. Occupations that typically have a work-year of less than 2,080 hours include musical and entertainment occupations, flight attendants and pilots, and teachers.

**Hourly versus annual wage reporting:** For each occupation, respondents are asked to report the number of employees paid within specific wage intervals. The intervals are defined both as hourly rates and the corresponding annual rates, where the annual rates are constructed by multiplying the hourly wage rate for the interval by the typical work year of 2,080 hours. In reporting, the respondent can reference either the hourly or the annual rate, but is instructed to report the hourly rate for part-time workers.

The *Unemployment Insurance (UI) Address File* is a micro-level employer file prepared quarterly by each State's Employment Security Agency and submitted to the Bureau of Labor Statistics. For 1997, the file from the third quarter of 1996 is used as a sampling frame, while the fourth quarter of 1997 is used as a source of population values for employment.

**Industry classifications** are based on the 1987 *Standard Industrial Classification Manual*, Office of Management and Budget, 1987. Industry is classified on the basis of the major product or activity of the establishment, as determined by total sales or receipts of the calendar year prior to classification.

### Scope of Survey

The survey included private establishments in SIC codes 07, 10, 12-17, 20-42, 44-65, 67, 70, 72, 73, 75, 76, 78-84, 86, 87, and 89 covering agricultural services; mining; construction; manufacturing; transportation and public utilities; wholesale and retail trade; finance, insurance, real estate, and services. The survey also covered private and government establishments in SIC codes 806, 821, 822, 824, and 829, the Postal Service (SIC 43), as well as all remaining state and local government establishments.

The reference date of the 1997 survey was the week that included October 12, November 12, or December 12 of 1997. The reference date for a particular establishment in this survey is dependent on its two-digit SIC code. See the table below.

Reference Date	Industries Surveyed
October 12	07, 15-17, 41, 46, 50-62, 67, 70, 73, 79, 84
November 12	26-28, 30, 35, 36, 40, 42, 45, 47, 48, 63-65, 75, 76, 78, 80, 81, 83, 86, 87, 89
December 12	10, 12-14, 20-25, 29, 31-34, 37-39, 44, 49, 72, 82, and state and local governments

### Sampling Procedures

The sampling frame for this survey was the list of establishments which reported to the state Unemployment Insurance (UI) files for the two-digit SICs listed above. For the 1997 survey, the frame's reference date was the third quarter of 1996. This frame was supplemented with a list supplying establishment information on Railroads (SIC 401).

Establishments in the universe were stratified by Metropolitan Statistical Area (MSA), three-digit SIC, and size of firm (i.e., size class). Size classes were defined as follows:

Size class	Number of Employees
1	1 to 4
2	5 to 9
3	10 to 19
4	20 to 49
5	50 to 99
6	100 to 249
7	250 to 499
8	500 to 999
9	1,000 or more

In 1996 and 1997, establishments in size classes 2 to 6 were selected based on a probability sample. The sampling weights in size class 2 were adjusted to account for the employment in size class 1. In 1998, the OES Survey began sampling establishments in size class 1; thus, establishments in all size classes are now represented in the probability sample. UI reporting units with 250 or more employees are sampled with certainty across the three year cycle of the survey. Approximately one third of these units are selected with each MSA/SIC/Size class each year. The above allocation resulted in a total initial sample size of 409,347. Then 408,801 UI reporting units or establishments were sampled for 1996 and 1997. The combined initial sample size for 1996 and 1997 is 811,945 UI reporting units or establishments. (Note that the combined sample size is not a simple sum of the two year's samples. Some state government establishments are included in the survey each year. In the tabulations for the combined survey these establishments are only included once, from the most recent year. Federal government units are also included in the combined tabulation.)

#### Method of Collection

Survey schedules were initially mailed to virtually all sampled establishments. Personal visits, however, were made to some of the larger establishments.

Two additional mailings were sent to non-responding establishments at approximately three week intervals. Telephone follow-ups and, in some cases, personal visits were made to non-respondents considered critical to the survey because of their size.

#### Response

Subsequent to the close-out date for National estimates, additional data were collected by the states and used to prepare their own estimates. Consequently, the response rates in most states are higher than the response rate used to develop estimates of all-industry wage rates for each MSA.

#### Estimation Methodology

The OES survey samples approximately 400,000 establishments each year and, over a 3-year period, contacts approximately 1.2 million establishments. Each single-year sample represents one-third of both the certainty and non-certainty strata for the full 3-year sample plan. While estimates can be made from a single year of data, the OES survey has been designed to produce estimates using the full 3 years of data. The full 3-year sample allows the production of estimates at fine levels of geography, industry, and occupational detail; while estimates using any one year of data would be subject to a higher sampling error due to the smaller sample size and the limitations associated with having only 1/3 of the certainty units. Producing estimates using 3 years of sample data provides significant

sampling error reductions (particularly for small geographic areas and occupations); however, it also has some quality limitations in that it requires the adjustment of earlier years' data to the current reference period—a procedure referred to as "wage updating."

The 1996 OES survey estimates, which were published in December 1997, were from the first year of the new OES wage survey and were developed using only a single year (i.e., 400,000 sample units) of data. The initial estimation methodology used a weighting-class adjustment procedure for non-respondents and an employment benchmark at the state/industry level. Since multiple years of data were not available for the 1996 estimates the estimation procedure did not involve "wage updating."

The 1997 OES survey estimates represent the second year of OES estimates and have been developed using both the 1996 and 1997 surveys. The 1997 estimates also represent the first year a "wage-updating" methodology was used to develop the OES survey estimates. In addition to the wage-updating procedure, the 1997 estimates use an improved estimation methodology, which utilizes a "nearest neighbor" imputation approach for non-respondents and applies employment benchmarks at a detailed MSA by 3-digit industry and broad size class level. A variant of the imputation procedure is also used to account for item non-response. (Note: Because of the difference in estimation methods for these first 2 years of OES estimates, the data from 1997 are not strictly comparable with those published from 1996, as is the case for 1999 data to be used in the Year 2000.)

The wage-updating procedure is used to adjust prior year wages to reflect increases between the previous data and current year data. This aging of wage data is accomplished through a multiplicative factor ( $1.000 + \text{rate of change}$ ) applied to prior year wages during the estimation process. For the 1997 estimates, the OES program has used the over-the-year fourth quarter wage changes from the Bureau's Employment Cost Index to adjust the 1996 survey data before combining it with this year's fourth quarter 1997 data. The ECI over-the-year wage changes provide the rate of change from the fourth quarter of 1996 to the fourth quarter of 1997 for the nine occupational divisions for which ECI estimates are available. Such a procedure assumes that each occupation's wage moves according to the average movement of its occupational division and that there are no significant geographic differences. Since this may not be the case, the wage-updating procedure has some quality limitations.

The hot deck (nearest neighbor) imputation procedure imputes for unit non-response. This type of non-response occurs when a unit reports no employment data. In hot decking, unit in the sample are stratified into 'year/State/4-digit industry/size class' cells. Within each cell a donor (i.e., responding unit) is selected to represent each non-respondent under the proviso that a donor cannot be selected twice. The sampling frame employment is used to match donors with non-respondents. Once a donor and non-respondent are matched, the occupational employment totals from the donor are copied over to the non-respondent. In the event that a donor is not available at the 'year/State/4-digit industry/size class' cell level the procedure advances to succeeding higher level cells until a donor is found.

Occasionally a responding establishment may provide employment information, but omit wage distribution information for selected occupations. The OES survey currently uses a variation of the mean imputation procedure to impute for item non-response. This type of non-response occurs when a unit reports the total-employment for its occupations but not the corresponding employment by wage intervals. In this procedure, units in the sample are stratified into 'year/MSA/3-digit industry/size class' cells. A wage-employment distribution is then calculated for those occupations with missing wage-employment based on the usable data in the cell. Missing wage-employment is imputed using the just calculated wage-employment distribution to prorate the total-employment of those occupations with the missing data.

A separate ratio estimator is used to develop estimates of occupational employment in each wage interval. The auxiliary variable is the population value of total employment obtained from the refined Unemployment Insurance files for the 1997 reference month. Within each MSA, the estimated employment for an occupation at the reported three-digit SIC/wage

interval level was calculated by multiplying the weighted employment by its ratio factor. The estimated employment for an occupation at the all-industry level was obtained by summing the occupational interval employment estimate across all industries within an MSA reporting that occupation. A further adjustment to each occupational employment total was made as described in the Reliability of the Estimates section. This adjustment did not affect the mean or median wage rates. The employment and wage data for federal government workers in each occupation were added to the survey derived data.

A *mean wage* and a *median wage* are calculated using wage data from establishments in the industries that reported employment for an occupation.

*Mean wage* is the estimated total wages for an occupation divided by its weighted survey employment. For the upper open-ended wage interval, a Winsorized mean procedure is used to estimate the mean wage. That is, the mean wage value for the upper open-ended wage interval is set at its lower bound (\$60.01). For the other intervals, a mean wage value is calculated based on occupational wage data collected by the Office of Compensation and Working Conditions. These interval mean wage values are then attributed to all workers reported in the interval. For each occupation, total weighted wages in each interval (i.e., mean wages times weighted employment) are summed across all intervals and divided by the occupation's weighted survey employment to obtain a mean wage.

*Median wage* is the estimated 50th percentile of the distribution of wages; 50 percent of workers in an occupation earn wages below, and 50 percent earn wages above the median wage. The wage interval containing the median wage is located using a cumulative frequency count of employment across wage intervals. After the targeted wage interval is identified, the median wage rate is then estimated by a linear interpolation procedure.

### Reliability of the Estimates

The occupational wage rates in this report are estimates derived from a sample survey. Two types of errors are possible in an estimate based on a sample survey - sampling error and nonsampling error. Sampling error occurs because the observations are based on a sample, not on the entire population. Nonsampling error is due to response, non-response and operational errors.

*Nonsampling Errors* - Estimates are subject to various response, non-response, and operational errors during the survey process. Sources of possible errors are data collection, response, coding, transcription, data editing, non-response adjustment, and estimation. These errors would also occur if a complete census were conducted under the same conditions as the sample survey. Explicit measures of their effects are not available. However, it is believed that the important response and operational errors were detected and corrected during the review and validation process.

The employment total and wage data for the occupation reflect only those industries that reported the occupation. This occurs primarily in those industries where the occupation appeared on the survey form. Since every occupation does not appear on every industry-specific form, there may be a bias in the employment and wage data for some occupations. The extent of this bias is unknown.

Another source of potential bias is the limitations placed on the size of the benchmark factors. A benchmark factor is the ratio of a known employment value to a sample-derived employment estimate. This factor is used to make a post-stratification adjustment that makes the total weighted employment estimate at the state / three-digit SIC industry / Metropolitan Statistical Area (MSA) / employment size class level match the population employment at that level. The source of the population employment data is the states' Quarterly Unemployment Insurance files for the reference period of the survey. In cases where a small sample was taken, the ratio factor can become large or small. In order to prevent an establishment from contributing either too much or not enough to an MSA's wage rate estimates, the benchmark factor was not allowed to exceed a predetermined value. The total employment count for those MSAs where the benchmark factor was limited

by this ceiling will be biased to a small degree in those strata. The employment not assigned to those strata because of this ceiling was then distributed across the other MSA in the state / three-digit industry, so that the estimated employment of the State / three-digit industry would match the known employment totals at that level.

**Sampling Errors**—The particular sample used in this survey is one of a large number of possible samples of the same size that could have been selected using the same sample design. For example, occupational wage rate estimates derived from the different samples will differ from one another. The deviation of a sample estimate from the average of all possible sample estimates is called the sampling error. The standard error of an estimate is a measure of the variation of estimates across all possible samples and thus is a measure of the precision with which an estimate from a particular sample approximates the average result of all possible samples. Estimates of sampling errors for the occupational employment and mean wage rate estimates at the National level are available from BLS-Washington.

### Quality Control Measures

Quality control measures implemented in the OES survey include:

- review of the specific occupations to be collected for each industry, and those to be collected in residual categories
- creating and validating the sample frame for all states at BLS-Washington
- allocating and selecting the sample for all states at BLS-Washington
- follow up solicitations of non-respondents (especially critical non-respondents)
- review of survey schedules to verify the accuracy and reasonableness of the reported data
- adjustments of atypical reporting units on the data file
- validation of the non-response adjustment factors
- validation of the population employment and ratio factors
- standardized data processing programs and activities

### Frequently Asked Questions

[http://stats.bls.gov/oes\\_ques.htm](http://stats.bls.gov/oes_ques.htm)

The following prose sections have been taken directly from the U.S. Government's non-copyrighted site describing this survey.

#### What does the OES program produce?

The OES program produces employment and wage estimates for over 750 occupations. These are estimates of the number of people employed in certain occupations, and estimates of the wages paid to them. These estimates are available for the nation as a whole, for individual States, and for selected metropolitan areas; national occupational estimates for specific industries are also available.

#### What basic concepts are essential to understanding the OES survey?

'Establishment,' 'Industry,' and 'Occupation' are three key concepts.

- An establishment is the physical location of a certain economic activity, for example, a factory, mine, store, or office. Generally a single establishment produces a single good or provides a single service. An enterprise (a private firm, government, or non-profit organization) could consist of a single establishment or multiple establishments. A multi-establishment enterprise could have all its establishments in one industry (i.e., a chain), or could have various establishments in different industries (i.e., a conglomerate).

- An industry is a group of establishments that produce similar products or provide similar services. For example, all establishments that manufacture automobiles are in the same industry. A given industry, or even a particular establishment in that industry, might have employees in dozens of occupations. The Standard Industrial Classification (SIC) system groups similar establishments into industries.
- An occupation is a set of activities or tasks that employees are paid to perform. Employees that perform essentially the same tasks are in the same occupation, whether or not they are in the same industry. Some occupations are concentrated in a few particular industries, other occupations are found in the majority of industries.

**What are the differences between the Bureau's Occupational Employment Statistics (OES) wage estimates and National Compensation Survey (NCS) wage estimates?**

Both the OES and the NCS programs provide information on wages and salaries by occupation, but they have different strengths.

- The OES survey provides earnings on an hourly and annual basis, including mean and median earnings for all areas--national, State, and MSAs--as well as 10th, 25th, 75th, and 90th percentile wage rate estimates for the nation. The NCS survey also provides mean earnings on an hourly and annual basis for all surveys and earnings distributions by the 10th, 25th, 50th, 75th, and 90th percentiles for some surveys. The OES program is the larger survey and can provide a greater range of occupations and areas, while the NCS program is conducted by personal visit and can provide greater depth by obtaining occupational work level.

The NCS occupational work level is based on the duties and responsibilities of the job. An architect, for example, who directs a major project would typically be more highly compensated than an architect preparing a small part of a project under direct supervision.

- The OES program provides information for more occupations (about 700 occupational classifications compared with about 450 occupational classifications in the NCS). The NCS program, on the other hand, provides information on the wages for the occupations it covers at specific levels of work rather than just an average for all workers in the occupation.
- The OES program provides information for the nation, for States, and for 334 metropolitan areas, as well as for the District of Columbia, Puerto Rico, the Virgin Islands, and Guam. The NCS program provides information for the nation, for 81 metropolitan areas and 73 non-metropolitan counties representing the U.S. and for the 9 Census divisions (although not all areas have information for all occupations).

The metropolitan definitions differ for the two programs: Where an area has both a primary metropolitan statistical area (PMSA) and a broader consolidated metropolitan statistical area (CMSA), the OES program uses the PMSA and the NCS program uses the CMSA.

- If you want wage estimates for pay-setting purposes, and want to set pay according to the level of work that is being performed, the NCS estimates are the better choice. If you need to know the general wage profile for a large number of occupations in a large number of areas, the OES estimates are the better choice. If you need information by State, you will need to use OES estimates.
- Both surveys include full- and part-time workers who are paid a



wage or salary. The NCS program obtains actual work schedules from the establishment, while the OES program assumes standardized schedules. Thus, if you need information on occupations in which the work schedule is atypical, you need to exercise caution in using the OES estimates.

- Both surveys exclude agriculture, fishing and forestry industries and private household workers; the OES program includes federal civilian employment, except for some national security agencies, while the NCS program excludes federal government employment.
- The OES program includes establishments with 5 or more workers, while the NCS program only includes establishments with at least 50 workers. Thus, if you want pay in a broader range of workplaces, use the OES estimates; if you want information about pay in larger establishments, use the NCS estimates.

#### **Does the BLS have OES estimates for specific industries?**

Yes, it has OES estimates, including a sample of national industry-specific occupational employment and wage estimates. The BLS produces national occupational employment and wage estimates for most 2- and 3-digit SIC industries. These estimates are available by request; there may be a charge for these data.

Industry-specific OES estimates for individual States may be available from the States' Labor Market Information (LMI) or Research, Analysis, and Statistics offices which are part of their State Employment Security Agencies (SESA's). Availability, format and medium of the data vary by State. To obtain OES data for a particular State, please contact the appropriate State office.

#### **Does the BLS have OES estimates for individual States?**

Yes, it has OES estimates, including state-wide cross-industry occupational employment and wage estimates for individual States. Additional information may be available from the State Employment Security Agency (SESA) in each State. Format and medium of the data vary by State. To obtain additional estimates for a particular State, contact the appropriate State office.

#### **Does the BLS have OES estimates for metropolitan areas?**

Yes, it has OES estimates, including cross-industry occupational employment and wage estimates for metropolitan areas.

Metropolitan areas comprise one or more entire counties, except in New England, where cities and towns are the basic geographic units. Where metropolitan areas are combined to form consolidated metropolitan areas (CMSA's) the component metropolitan areas are designated primary metropolitan statistical areas (PMSA's). Metropolitan areas that are not combined to form CMSA's are designated metropolitan statistical areas (MSA's). There is more information about metropolitan areas on the Census Bureau web site.

The OES program produces cross-industry occupational employment and wage estimates for MSA's and PMSA's. The OES program does not produce estimates for CMSA's. The metropolitan area definitions used to produce OES estimates are those that were in effect during the year prior to the survey year. The definitions of some metropolitan areas or their components may have been changed since the current OES estimates became available.

#### **What is the difference between 'Occupational Employment and Wage estimates' and 'Industry Staffing Pattern estimates'?**

The Occupational Employment Statistics program produces 'Occupational Employment and Wage estimates' and 'Industry Staffing Pattern estimates'-- both of which consist of employment and wage estimates by occupation. The 'Occupational Employment and Wage estimates' consist of national, State and metropolitan area estimates. The 'Industry Staffing Pattern estimates' contain only national estimates.

The main difference is that the 'Occupational Employment and Wage estimates' are cross-industry estimates, and the 'Industry Staffing Pattern estimates' are industry-specific estimates.

- Cross-industry estimates are calculated with data collected from establishments in all the industries in which a particular occupation is surveyed. (Not every occupation is surveyed in every industry.) For example, the cross-industry occupational employment estimate for mechanical engineers is the sum of all the industry-specific estimates for mechanical engineers. Likewise, cross-industry occupational wage estimates for mechanical engineers are calculated from data collected from establishments in all the industries where mechanical engineers are surveyed.
- Industry-specific estimates are calculated with data collected from establishments in a particular industry. Industry-specific occupational employment estimates are based on the number of people employed in that occupation in a particular industry. Similarly, the industry-specific occupational wage estimates are calculated with data from establishments in one particular industry. Since different industries employ people in different occupations, the occupations in the staffing pattern for one industry will not be the same as the occupations in the staffing pattern for another industry.

Prior to 1996, national industry-specific estimates of occupational employment were the only OES estimates produced by the BLS; wage estimates were not produced.

#### **Why are an occupation's cross-industry employment and wage estimates calculated from 'industries in which it was surveyed'?**

OES estimates are calculated from data that employers provide by filling out survey forms. There are different survey forms for different industries. The occupations listed on survey forms vary depending on the industry and size of establishment. No survey form contains all 750+ OES occupations, because no industry employs workers in every occupation. Survey forms contain between 50 and 225 occupations. Customizing the survey forms reduces paper work and respondent burden, making the survey form easier for employers to fill out. This increases the response rate and allows the OES program to produce better estimates.

When an occupation's industry-specific employment estimates are summed to produce its cross-industry employment estimates, only those industry-specific estimates from industries where the occupation appeared on the survey forms are included in the summation. Similarly, the calculation of an occupation's cross-industry wage estimates is made with data from industries where that occupation was surveyed. There exists the possibility that some employment in a particular occupation could exist in an industry where it was unexpected and therefore, not surveyed -- in such cases it would be missed and not included in the calculation of that occupation's employment and wage estimates.

#### **Why are OES estimates from the 1996 and 1997 surveys not comparable (etc. to Ye: 2000)?**

The 1997 OES employment and wage estimates presented on this web site are based on data from both the 1996 and 1997 OES surveys. The two years of sample responses for employment and wage data have been combined to produce

the 1997 estimates. The 1996 wage data have been adjusted to the 1997 reference period by using the over-the-year wage change in the most applicable Employment Cost Index (ECI) series. The employment estimates from 1996 and 1997 have been adjusted to the full universe counts for the 1997 survey reference period based on the Covered Employment and Wages (ES-202) program. Furthermore, the estimation methodology has been improved since the 1996 estimates were prepared. Therefore the 1997 OES estimates are not strictly comparable to the 1996 OES estimates, and the Year 2000 data (collected in 1998 and 1999) are not strictly comparable either.

**Why does the OES survey produce estimates from more than one year's data?**

Significant reductions in sampling error can be achieved by taking advantage of a full three years of data, covering 1.2 million establishments and over 70 percent of the employment in the United States. This feature is particularly important in improving the reliability of estimates for detailed occupations in small geographical areas. Combining multiple years of data is also necessary to obtain full coverage of establishments with 250 or more workers since, in order to reduce respondent burden, the OES survey samples them only once every three years.

While there are significant advantages, there are also limitations associated with this estimation procedure in that it requires "wage updating" for the earlier years of data. For "wage-updating" purposes, the Bureau has used the national over-the-year wage changes from the fourth quarter of 1996 to the fourth quarter of 1997 for the nine occupational divisions for which ECI estimates are available. Such a procedure assumes that each occupation's wage, as measured in the earlier years, moves according to the average movement of its occupational division and that there are no major geographic differences. BLS will conduct research to determine the accuracy of this approach and to investigate other approaches.

**Does the OES survey produce estimates by age, race, sex, or educational attainment?**

No. The OES survey program does not gather demographic information. However, the BLS' Labor Force Statistics from the Current Population Survey program provide information on employment, unemployment, and weekly earnings, by a variety of demographic characteristics.

**Does the OES survey produce estimates by size of establishment?**

No. The OES survey does not produce estimates based on total establishment employment. Information pertaining to the number of establishments in various employment size classes and their aggregate employment (economy wide and by industry) can be obtained by contacting the staff at the 'ES-202' or Covered Employment & Wages program.

**Does the OES program have any data on unemployment for specific occupations?**

No. The OES survey does not produce estimates on unemployment. However, there is some information on selected unemployment indicators (including broad occupational groups) in *The Employment Situation* news release, which is part of Labor Force Statistics from the Current Population Survey. More detailed information on characteristics of the unemployed can be obtained by contacting the Labor Force Statistics staff.

**Does the OES program have any information on job vacancies?**

No. The OES survey does not ask establishments for information about any vacancies they may have. The U.S. Department of Labor maintains a web site where job seekers can search America's Job Bank for job vacancies.

**Does the BLS have employment projections for specific occupations?**

For more than 50 years, the Bureau's Occupational Outlook Handbook has been a nationally recognized source of career information. It describes what workers do on the job, working conditions, the training and education needed, earnings, and expected job prospects for a variety of occupations.

**How are "employees" defined by the OES survey?**

Employees are all part-time and full-time workers who are paid a wage or salary. The survey does not cover the self-employed, owners and partners in unincorporated firms, household workers, or unpaid family workers.

**Does the BLS have occupational employment estimates that include the self-employed?**

The Bureau of Labor Statistics' Office of Employment Projections provides current and projected national economy-wide (across all industries, including the self-employed) occupational employment estimates for selected occupations.

**How are "wages" defined by the OES survey?**

Wages for the OES survey are straight-time, gross pay, exclusive of premium pay.

**Included** in the collection of wage data are:

- base rate,
- cost-of-living allowances,
- guaranteed pay,
- hazardous-duty pay, incentive pay including commissions and production bonuses, and
- on-call pay.

**Excluded** from the wage data are :

- back pay,
- jury duty pay,
- overtime pay,
- severance pay,
- shift differentials,
- non-production bonuses, and
- tuition reimbursements.

**How long has the OES survey collected wage data?**

The OES survey collected both occupational employment and occupational wage data nationwide for the first time in 1996. Prior to 1996, occupational employment estimates by industry were the only national OES estimates produced by the BLS.

**What are mean wages? What are median wages?**

The OES program produces estimates of wages by occupation; i.e., the wages paid to wage or salary employees in a given occupation in the U.S., in a particular state, or in a particular industry. These occupational wage estimates are either estimates of mean wages or median wages.

- A mean wage is an average wage. An occupational mean wage estimate is calculated by summing the wages of all the employees in a given

occupation (either in the U.S., a particular state, or a particular industry) and then dividing the total wages by the number of employees.

- A median wage is a boundary. An occupational median wage estimate is the boundary between the highest paid 50% and the lowest paid 50% of workers in that occupation (either in the U.S., a particular state, or a particular industry). Half of the workers in a given occupation earn more than the median wage, and half the workers earn less than the median wage.

#### How is the OES survey conducted?

The Occupational Employment Statistics (OES) survey is an annual mail survey measuring occupational employment and wage rates for wage and salary workers in nonfarm establishments, by industry. The survey samples approximately 400,000 establishments per year, taking 3 years to fully collect the sample of 1.2 million establishments. BLS and the Employment and Training Administration (ETA) provide the funding for the survey. BLS provides the procedures and technical support, while the State Employment Security Agencies (SESAs) collect the data. The SESAs produce occupational estimates by detailed industries for local areas and the states. BLS produces similar industry-specific estimates for the nation as well as employment and wage estimates for 750 occupations across all industries for the nation, each of the 50 states plus the District of Columbia, and Metropolitan Statistical Areas (MSAs).

#### When will this year's OES estimates be available?

The OES program produces estimates from data collected in an annual nationwide survey. The survey begins with survey materials being sent to selected establishments during the last quarter (October, November, December) of the survey year. Data collection starts then and continues into the early months of the following year. As the data collection finishes, the data entry and estimates processing begins, and this is followed by estimates production and validation. The OES estimates are released in the last quarter of the year following the survey.

#### What occupations are surveyed?

An establishment responding to the OES survey should report all employment according to the OES classification system, which is an empirically-based economy-wide occupational classification system. The OES occupational classification system identifies over 750 occupations. Each OES occupational classification comprises a title, a definition, and a five-digit OES code.

#### How does the OES program classify occupations?

OES occupational classifications are grouped into seven divisions:

1. Managerial and Administrative;
2. Professional, Paraprofessional, and Technical;
3. Sales and Related;
4. Clerical and Administrative Support;
5. Service;
6. Agricultural, Forestry, and Fishing; and
7. Production, Construction, Operating, Maintenance, and Material Handling.

Each division is subdivided into major and minor occupational groups. A five digit OES code is assigned to each OES occupation. The first digit represents the occupational division; the second, the major group; the third, the minor group; and, along with the first three digits, the last two digits identify the detailed occupation. When the OES occupational classifications are listed in OES code order, similar occupations are listed together.

**Is the OES classification system compatible with other occupational classification systems?**

Yes. The OES classification system is compatible with the 1980 Standard Occupational Classification System (SOC) and the U.S. Bureau of the Census occupational classifications. By using a 'crosswalk' to the SOC or Census system users can compare OES estimates with occupational data from other sources. The NOICC Crosswalk is the source of various 'crosswalks' that are used to link the occupational classifications of one system to those of another.

**How does the OES program define industry classifications? What is the SIC?**

The OES program uses definitions of industries found in the Standard Industrial Classification (SIC) system. The SIC system is used throughout the federal government to group establishments into industries. The SIC Division Structure makes it possible to collect and calculate establishment data by broad industrial divisions (labeled A through K), industrial groups (the 2- and 3-digit SIC levels), and specific industries (the 4-digit level). See the *Standard Industrial Classification Manual, 1987* (Executive Office of the President, Office of Management and Budget), available in many libraries. The OES survey produces occupational employment and wage estimates for 2- and 3-digit SIC industrial groups. (Note: OES estimates of government employment and wages do not correspond to the SIC system. In the case of government, the OES survey produces occupational employment and wage estimates for local government, state government, and Federal Government.)

**What industries are surveyed? What industries are not surveyed?**

The OES survey collects occupational employment and wage data from establishments in nonfarm industries. The OES survey produces estimates of occupational employment and wages for 2- and 3-digit industrial groups in these industrial divisions: Mining; Construction; Manufacturing; Transportation, Communication, Electric, Gas, and Sanitary Services; Wholesale Trade; Retail Trade; Finance, Insurance, and Real Estate; Services; and Government.

The OES program does not survey establishments in SIC 01 (Agricultural production--Crops); SIC 02 (Agricultural production--livestock and animals specialties); SIC 08 (Forestry); SIC 09 (Fishing, hunting, and trapping); and SIC 88 (Private households) are not surveyed.

**Does the BLS make OES estimates available in print or electronic form?**

The BLS makes OES estimates available via this Internet site, in publication, and in electronic format.

- This Internet site contains cross-industry Occupational Employment and Wage estimates for the U.S., for individual states, and for metropolitan areas. It also has a sample of national (industry-specific) Industry Staffing Pattern estimates.
- The BLS produced annual OES publications containing occupational employment estimates by industry for 2-digit SIC industrial groups from 1988-1995. (These publications do not contain wage estimates.) The 1997 OES publication presents both selected occupational employment and wage estimates for 2-digit SIC industrial groups.

- OES estimates in electronic format are available by request. The BLS can provide 1997 occupational employment and wage estimates by industry (for 2- and 3-digit SIC industrial groups). There may be a charge for estimates in electronic format.

### Statement Regarding ERI's Assessor Series Norms for Use with Immigration Prevailing Wage Analyses/Reports

Presently, it is ERI's understanding that each state's employment security agency makes its own interpretation of the guidelines in GAL No. 2-98 and the new GAL No. 1-00. Consequently, the year of 1998 and 1999 found that many different State interpretations of GAL No. 2-98 were made. Hopefully, with time, there may become a more consistent interpretation of GAL No. 2-98 among the States especially in light of GAL No. 1-00. Many employers and attorneys are reporting that the prevailing wage determinations made by States (based on OES data) are unreasonably high. Others have raised the question as to whether or not the present application of the regulations should be legally challenged. Some states appear not to be accepting many "other survey" datasets (with Texas leading the way). Other states are reported (such as Utah) to not accept other survey data unless prepared by an independent third-party.

Canada, to ERI's knowledge, has no regulations or laws similar to that of GAL No. 2-98.

However, many states are accepting ERI Economic Research Institute Assessor findings related to prevailing wages as a supplement to OES data. It should be noted that ERI's **DOS Salary Assessor** (first released in 1988) was not designed for GAL No. 2-98, which was issued October 31, 1997. ERI presents a "Private Survey Comparison" (tested in 1995 as a module of the Windows95 **Salary Assessor** and now part of the **Geographic Assessor**) as a direct response to GAL No. 2-98. The norms found in the **Geographic Assessor** are imported medians reported by **SalariesReview.com**. They are produced so that a user may ascertain the reasonableness of an OES reported value. Should there be significant differences, further research may be warranted (most likely because OES class composition is masking the true pay of a position).

While many states are accepting our findings, three states (to our knowledge at this time) are not: New York, California, and New Jersey. While their interpretations appear to be based on the pre-GAL 2-98 version of ERI's old products, **Salary Assessor** DOS and not the **Geographic Assessor** Win95/98/NT, their comments are cited below.

ERI data is based on multiple surveys that help assure all industry coverage per GAL No. 2-98. However, New Jersey has interpreted the GAL guidelines as follows: "...the regulations outlined in General Administrative Letter No. 2-98 (GAL 2-98) do not allow for combining of wage data from separate surveys....".

Under this definition, it appears the only single wage survey that will comply with New Jersey's interpretation is the OES survey itself. Few, if any, single published surveys (except OES) cover all industries in every location. And the fact that, to our knowledge, the Level I and Level II prevailing wage means have not been published by New Jersey puts the State's services in a commanding position.

Another objecting state is New York, which is concerned that because ERI data is based on multiple wage surveys, imbalance may be created by the double weighting of certain companies' data. Their concerns include: "What steps were taken to insure that the employees in the component surveys are not represented more than one company? It is noted that the inclusion of results (by ERI) from OES and BLS National Compensatory Survey makes duplication representation highly likely."

This interpretation apparently means that in the State of New York, a survey can only be used if the companies that participate in one wage survey do not provide data to any other

wage surveys during the two year period specified in GAL No. 2-98 (either a private survey or a government survey). If a company provided data to more than one survey during a two year period, then those surveys may not be used as part of a multiple survey approach. Being that ERI uses both private and governmental wage surveys and that most major employers participate in more than one survey over a two year period, this interpretation appears to effectively block the use of multiple survey analyses in the State of New York (until such time as someone introduces New York statisticians to the Central Limit Theory).

At some future date the Department of Labor may release further guidelines to bring about consistency among the States in their interpretations of GAL No. 2-98. In the interim, ERI Economic Research Institute does not plan on developing a new methodology or product each time one State makes a different interpretation of GAL No. 2-98. Only when the Department of Labor issues further clarification of GAL No. 2-98 will ERI review its Prevailing Wage methodology to comply as best it can with DOL interpretations of GAL No. 2-98. At this time, ERI cannot predict which States will or will not accept **Assessor** analyses for immigration application purposes. It, therefore, presents them as Prevailing Wage Comparisons. **Assessors** report both medians and means. For a review of the real world versus that constructed by the OES survey, we recommend inquirers review all ERI research, including the following Internet Based Surveys (available for a fee of \$19 per report or free with data input).

#### **U.S./Canada Wage & Salary Survey**

A report of any one of 4,000 position's competitive salary and incentive data in any of 5,800 locations (representing 3,000 jobs and 647 geographic areas within the U.S. and Canada).

#### **U.S./Canada Cost-of-Living Survey**

A report listing 18 key cost items affecting housing, transportation, taxes, services and consumables for 5,800 city/locations. Each area's COL is compared to a national level.

#### **U.S./Canada Employee Benefit Survey**

48 key employee benefit practice measures, including employee and organization costs in 49 industries across 76 states, provinces, and territories and 647 metropolitan employment areas.

#### **College Graduate Offer Survey**

A report of salary and first year incentive offers to college graduates in any of 7,200 worldwide locations for any one of 1,800 degrees using a 5,100 worldwide college/university database.

#### **International Cost-of-Living Survey**

A report listing 18 key cost items for 1,400 locations; data are expressed in the respective country's currency, with an area's COL compared to a country's and the U.S. average.

#### **International Remuneration Survey**

A report of any one of 4,000 position titles shows salary and incentive national norms in any of 1,400 locations and 210 countries. (No country has less than 24 positions).

### **Statement Regarding ERI's Trend Analysis of OES Data**

This data is presented free of charge to any Internet inquirer and is non-copyrighted. ERI cannot be liable for errors in the data download, nor does it present the "trending" of this data as acceptable to any Government agency for immigration purposes. All calculations a "trend" average can be "reengineered" by utilizing the means shown at the bottom of each page/report (calculating the  $y = a + bx$  equation). We again note the large difference between OES reported 1997, 1998, 1999 and 2000 data and the consequent larger



predictions (that may be unrealistic). ERI has not altered OES data, and presents trends ; they were calculated. The same is true for Canadian Census data.

At this time ERI knows of no other source where historical 1998 and 1999 data, along with Year 2000 data, can be reviewed simultaneously. Whether any State Agency will accept ; trending of data is unknown. Again, we refer the reader to [http://www.eri.com/letter2-98oes\\_ques.htm](http://www.eri.com/letter2-98oes_ques.htm).

Finally, we apologize for this lengthy methodology. The application of OES data (and nex year's complete revision of the survey using SOC codes) is an evolving process. This methodology's prose will continue to be modified as we learn and report upon the evolutio of this process and survey. With the before-mentioned changing of all the position descriptions (SOC prose versus OES prose), Year 2001 data presentations likely will be even more complex (and this Methodology more lengthy).

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This application requires the use of Internet Explorer 4.x and above.

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**COMPENSATION**

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**Compensation** is the term used in the U.S. for the wages or salaries paid to employees plus the benefits received. In other countries this is often called remuneration.

**ERI does not practice law and neither interpretation nor explanation of a tax code or law is either implied or intended in any of its Assessor or Platform Library prose. Please contact legal or tax counsel with any questions (or for any interpretation).**



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## Compare our Site

Be very careful when offering links to sites that offer salary and benefit advice. To our knowledge, **SalaryExpert.com**, sponsored by BTA, is the only free Internet salary site that is licensed, shows its sources, displays conservative values and standard errors, and protects linking sites and visitors from liability. Other free sites offer compensation and benefit advice *without a license* and may be guilty of a felony in states such as Connecticut.

As a greater disservice, these sites often inflate salary data in order to attract visitors. Employees who review this data may become resentful. (9 of 10 probably won't confront management, but their attitudes and performance may suffer.) Employers who use these sites may overpay their staff. Either way, companies that rely on this unlicensed data will see their bottom lines' suffer.

David J. Thomsen, CCP,  
Ph.D., ASA  
President, Baker, Thomsen  
Associates

### SalaryExpert.com

- Displays correct, conservative values
- Offers ~30,000 jobs' average pay
- Provides a reliability standard error
- Shows sources and source data
- Provides a population ("n") estimate, illustrates if the job exists in an area
- Shows pay for 45,000 U.S./Canada cities
- Provides buying power comparisons
- Shows total compensation with benefits
- Displays a full statistical methodology
- Access to pay data in 209 countries
- Source data defensible in court
- All data compared to national norms
- Conservative values assist management
- Available via a wireless device (WAP enabled phone/PDA)
- Does not require an "exclusive"

### Free Sites - Providing Questionable Data

- Show higher salary values to attract web visitors
- Offer data on only a limited number of jobs
- Reliability statistics are not provided
- Do not disclose all sources, show no source data
- Provide no population "n" (show nuclear engineers in Juneau, Alaska when none exist)
- Display salaries in less than several hundred areas
- No comparison cost-of-living data is provided
- Show no employee benefit data, but give advice
- Limit explanations of "methodology"
- Provide data for only a few U.S. jobs
- Doubtful admissibility per Court challenges
- No cost-of-living, benefit or combined comparisons
- High values create inflated employee expectations
- No wireless device edition available
- Requires an exclusive, one year

relationship

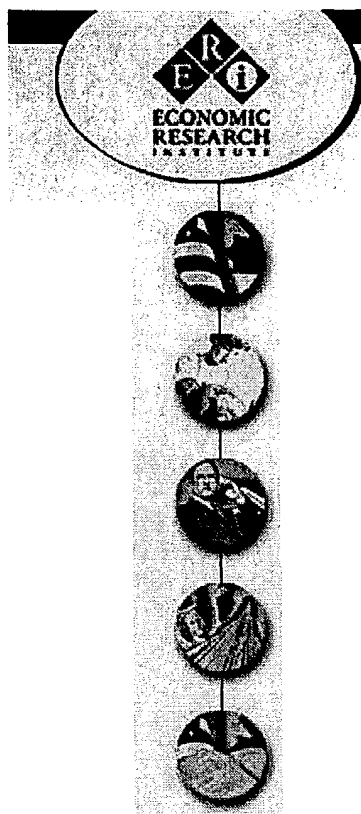
- Relationship is that of an "Affinity Provider"

relationship

- Relationship is a partnership with shared liability
- 

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## Immigration Wage/Salary Trends

Review projected Occupational Employment Statistics compensation based on 1 data. The OES survey data is a non-copyrighted U.S. survey. Copyrighted Census earnings data were provided by Statistics Canada.

**A** [QuickZip](#)

Enter a postal code to jump to Step 3!

[Methodology](#)

Enter your position request here. (Wait for the screen to refresh itself after each selection.)

Step 1. State/Province

--Select a state--

Step 2. OES/Census Area

--Select a city--

Step 3. Position

--Select a position--

Description - No Position Selected

Alternate Titles

Copyright 1999 - 2001 ERI Economic Research Institute. All Rights Reserved. Patent Pending  
This application requires the use of Internet Explorer 4.x and above.



# SalaryExpert

## OES Immigration Wage Data

Projected Occupational Employment Statistics - Current Trends

### Tools for the:

#### Individual

- ▶ Premium Salary Report
- ▶ Job Search Report
- ▶ Career Interest Report

#### Executive

- ▶ Compensation Report
- ▶ Comparables Report

#### Nonprofit Executive

- ▶ Compensation Report
- ▶ Comparables Report

#### HR Manager

- ▶ SalaryExpert Pro
- ▶ Nonprofit Assessor

#### College Student

- ▶ Student Cost of Living
- ▶ Salary Potential in 2018

#### International Reports

- ▶ Remuneration Report
- ▶ Cost-of-Living Report

### Questions?

Call TOLL-FREE  
877.799.3427  
Mon. thru Fri.,  
8am to 9pm,  
Eastern Time.



This application is designed specifically for attorneys or corporation's assessment of the overpayment created by data in 2004.

Analyze 2004 U.S. Occupational Employment Statistics compensation based on 2002 data to ascertain if it cause overpayment. OES survey data is a non-copyrighted U.S. survey; data shown includes 2001 data. Copyrighted Census earnings data were provided by Statistics Canada.

### FastFind

Enter a postal code to skip steps 1-3!

  A

NOTE: You must wait for the screen to refresh after each selection.

- 1 Country:   B
- 2 State/Province:   C
- 3 City:   D
- 4 Job/Position:   E

Job Description: [Click Here](#)

Alternate Titles: No Alternate Jobs Found

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# SalaryExpert

## OES Immigration Wage Data

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### FastFind

Enter a postal code to skip steps 1-3!

NOTE: You must wait for the screen to refresh after each selection.

1 Country:

2 State/Province:

3 City:

4 Job/Position:

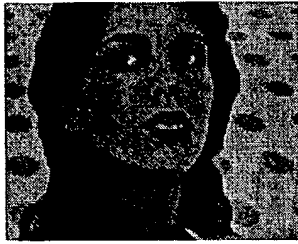
### Government Affairs Manager

Job Description: [Click Here](#)

Alternate Titles: Government Affairs Manager, Manager Government Affairs, Regulatory Affairs Manager

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## Tools for the:

**Individual**

- ▶ Premium Salary Report
- ▶ Job Search Report
- ▶ Career Interest Report

**Executive**

- ▶ Compensation Report
- ▶ Comparables Report

**Nonprofit Executive**

- ▶ Compensation Report
- ▶ Comparables Report

**HR Manager**

- ▶ SalaryExpert Pro
- ▶ Nonprofit Assessor

**College Student**

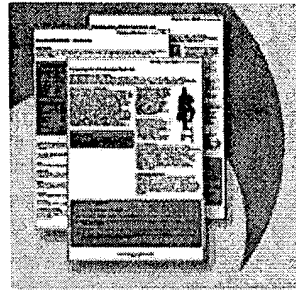
- ▶ Student Cost of Living
- ▶ Salary Potential in 2018

**International Reports**

- ▶ Remuneration Report
- ▶ Cost-of-Living Report

**Questions?**

Call TOLL-FREE  
877.799.3427  
Mon. thru Fri.,  
8am to 9pm,  
Eastern Time.

**Intermediate Sanctions Comparables Report™**

Price: \$14.95

# SalaryExpert

**Compare top management pay within your tax-exempt indu**

SalaryExpert's Intermediate Sanctions Comparables Report shows the 12 close organizations within a selected National Taxonomy of Exempt Entities industry. Define your geographic area and organization size and retrieve the latest available compensation tables available in a dynamic read and retrieval of data from the 990 databases. This Report is suitable for sharing with one's compensation or management. **NOTE: AVAILABLE FOR THE U.S. ONLY**, for-profit organizations utilize the SalaryExpert Executive Comparables Report (which draws from SEC databases).

**The Intermediate Sanctions Comparables Report includes the following:**

- **Overview of Executive Compensation** - Provides a broad view of compensation is about and how it is determined.
- **Twelve Executive Compensation Comparables** - 12 summary compensation tables providing a comparison of top management pay among a comparison grouping of organizations within your tax exempt industry sector (1/2 geographic area and 1/2 selected by size).

This past year per IRC Code 4958, a "rebuttable presumption of reasonableness" was established for questions relating to reasonable compensation of U.S. executives highly paid. It established a norm that can be utilized in all entities as it re-existence of comparability data based on industry surveys, documented compensation similar positions in similar organizations, or expert compensation (consulting) organizations with gross receipts of less than \$one million/year one needs data; similar positions in similar communities; larger organizations need more thorough data. This data must be documented, shown as relied upon by a decision-making body obtained, who in the decision-making body was present during the discussion, the terms of the approved compensation, and the date of approval.

Note: If involved with litigation, this Report, with its one analysis filter, is not. SalaryExpert recommends your subscribing to ERI's Executive Compensation / contains both "for profit" and "exempt entities" editions (drawing on SEC proxy 990s by NAICS code). This software and these databases (from which SalaryExpert the right to extract comparables) have been consistently and extensively used since 1988. Also note that IRC 4958 allows tax exempt entities to utilize for-profit comparables if the circumstances warrant.

**Position Look-Up**

See if the position you are seeking information on is available for this report.

**This report offers information for one of the five top paying positions.**

As a default, it is assumed that this is the highest paying position within the organization.

Highest Paid Executive

**NOTE:** Executive positions only, for 2004 only top 5 job's data available.

**Intermediate Sanctions Comparables Report Payment Form**

\* Takes five minutes \* Money-back guarantee

\* PLEASE NOTE: THE EXECUTIVE AND JOB SEARCH REPORTS ARE FOR THE U.S. ONLY

Please provide your e-mail address, a password, and your payment information.

**NOTE:** Your e-mail address will serve as your login user name to securely access your report(s). All information provided will be kept strictly confidential. SalaryExpert.com will not sell your e-mail address. Your e-mail address will only be used to send you periodic e-mails from which you may unsubscribe at any time.



User Type: ☒ New ☐ Returning

First Name:



55(a)



Last Name:

Address Line 1:

Address Line 2: (not required)

City:

State / Province:

Postal Code:

Country:

E-mail:

Password:  (10 chars max)

Retype Password:  (new users only)

Cardholder's Name:  (as on card)

Credit Card Number:  (no spaces)

Expiration Date:

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55(b)

## Methodology/Disclaimer

### Immigration Wage/Salary Analysis

### Occupational Employment Statistics Salary Surveys

#### Use of This Data - Disclaimer

**This site is designed specifically for an attorneys or corporation's assessment of the overpayment created by use of OES data in 2003.** 5

This data is provided "as-is" and ERI makes no warranty, either express or implied, including but not limited to, warranties of correctness and fitness for a particular purpose. In no event will ERI be liable for any indirect, special, consequential or other damages however caused. Data has been taken from datasets provided to ERI by the U.S. and Canadian Governments. In some cases, no published assignments of geographic areas exist (Canadian areas were created by ERI); in other cases ERI has found data that appears to be incorrectly keyed. ERI presents a crosswalk among DOT, SOC, OES, and NOC code from its best effort analyses of reported data; to ERI's knowledge, no Government published crosswalk exists between U.S. and Canadian jobs. ERI has no way to audit this data; it is republished as collected. U.S. raw data shown is non-copyrighted (as is all U.S. Government data), while Canada Census data (which is copyrighted) is shown with Statistics Canada's written permission under an annual License Agreement. 10 15

#### 2003 Data Introduction

Raw OES data shown is to be used for 2003, although it was collected mainly in 2001 (and is often called either 2001 or 2003 data). Historic data (for the previous three years) can be found at [www.erieri.com/doltrends](http://www.erieri.com/doltrends). Data for 2001 included three new areas: Auburn, Alabama; Corvallis, Oregon; and Missoula, Montana; no new areas were created for 2002 or 2003. The major change in the past years has been the shift from OES job descriptions and numbers (5 digit) to SOC descriptions and codes (6 digits). Although this data is also found on various government websites (Federal and state), few provide Level I and Level II data which is the only OES data that can be used (per GAL 2-98). Accessed through either ERI's Platform Library or ERI's Geographic Assessor, these values are incorporated and reported as compared to private survey norms. 20 25

#### 2003 Estimated Overpayment

ERI now estimates the overpayment potentially caused by the use of OES data in 2003. OES data for most positions (Level II) is set at the 67<sup>th</sup> percentile and oftentimes includes supervisory positions within the sample. ERI utilizes its Assessor Series database to create a corresponding value as derived from a consensus of all other private and public available salary surveys for that position and area. ERI adjusts this value for expected salary increases (while H1-B visa recipients are projected to receive no increases). Should a potential overpayment be calculated, that amount is shown. Should no overpayment be calculated, that message will also appear. 30

#### 2003 Data Notes

Raw OES data is supplied to ERI by the Department of Labor. This data shows Level I and Level II, along with standard errors. The dataset does not contain national norms nor does it contain states. ERI extracts the state ("3") and national ("4") as they are often found within a city area (where the jobs exist, but the U.S. government wishes the state or national default used). Larger city data is available on from [www.bls.gov](http://www.bls.gov) and later in each year, the above Level I and Level II data is found at <http://edc.dws.state.ut.us/owl.asp>. ERI creates State and National mean norms, when not reported in these datasets, by calculating a weighted average for a State or National position (if population is not known, ERI assigns a value of 10 incumbents to the value shown; the latter evidencing that the position exists but that the Government has chosen not to report populations even though, for instance, they will report standard errors.) Data is shown for general use; for prevailing wage usage, this is moot because submitters may not utilize means (only Level I or Level II data). 35 40

#### OES Survey Job Class Description



# SalaryExpert

## Projected Occupational Employment Statistics (OES) Report

### Tools for the:

#### Individual

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- ▶ Job Search Report
- ▶ Career Interest Report

#### Executive

- ▶ Compensation Report
- ▶ Comparables Report

#### Nonprofit Executive

- ▶ Compensation Report
- ▶ Comparables Report

#### HR Manager

- ▶ SalaryExpert Pro
- ▶ Nonprofit Assessor

#### College Student

- ▶ Student Cost of Living
- ▶ Salary Potential in 2018

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### Questions?

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**Position Selected: Government Affairs Manager**

**Job Group/Class: Public Relations Managers (Job Zone (5) / SVP (8))**

### OES Survey Job Group/Class Description

Plan and direct public relations programs designed to create and maintain a favorable public image for employer or client; or if engaged in fundraising, plan and direct activities to solicit and maintain funds for special projects and nonprofit organizations. (Source: OES/BLS/ETA Description)

Included are jobs that may have the title of: Manager, Director, Vice President, or other Middle Manager positions. Excluded are first-level supervisors, owners and partners of unincorporated firms, and General Managers and/or Top Executives.

Wage/Salary level for this Job Group/Class is a consolidated value from all the jobs listed in the section

### Requested City/Suburb:

Arlington, Virginia United States of America

### ERI Area:

Washington, DC-MD-VA-WV PMSA

### 2003 Trended Mean:

US\$ 80,574

### Reliability Statistics:

Observations: 3,980  
Standard Error: 3.10 % (as reported)

### Survey/Type:

Trend of OES Level 1 Data = MSA, PMSA, or Balance of Area

### Survey/Source Name:

ERI's Prevailing Wage - DOL Data Analysis

### Survey Data Publishers:

ETA, BLS, OES & State Employment Agencies - 2003 Estimate

### Data Projected/Trended to:

July 2004

### Data Collection Dates:

October 1996 - August 2003

### SOC Job | ERI Area

112031 | 118840

### ERI/eDOT | OES Job

169.167-108 | 13011

### Salary Survey Area:

ARLINGTON; BERKELEY; CALVERT; CHARLES; CLARKE; CULPEPER; FAIRFAX; FAUQUIER; FREDERICK; INDEP ALEXANDRIA; INDEP FAIRFAX; INDEP FALLS CHURCH; INDEPENDERICKSBURG; INDEP MANASSAS; INDEP MASSACHUSETTS; JEFFERSON; KING GEORGE; LOUDOUN; MONTGOMERY; PRINCIPAL; PRINCE WILLIAM; SPOTSYLVANIA; STAFFORD; WARREN; WASHINGTON D.C.

### Job Titles Included

Selecting any one of the titles below takes you to an actual survey (for this position and area). The data displayed are medians, the most common measure used by private industry; not the weighted mean recommended by GAL 2-98). This comparison allows the further assessment of the possibility that private industry surveys may provide weighted average data significantly more or less than the OES job class mean that is derived from the U.S. DOL from multiple positions. For an independent analysis of the competitive accuracy of OES data, refer you to: [QuickCalls](#).

Account Executive  
Account Manager Sales  
Area Manager Retail  
Director Advertising  
Director Fundraising  
Director Funds Development  
Director Major or Capital Gifts  
Director Media Marketing  
Director Underwriter Sales

Manager Sales Account  
Manager Special Meetings  
Manager Technical Publications  
Manager Technical Writers  
Market Research Manager  
Marketing Director  
Marketing Manager  
Media Director  
Media Manager

Director Underwriter Solicitation	Meeting Manager
District Manager Retail	Order Processing Manager
Executive Producer Promos	Package Design Manager
Fashion Coordinator	Public Relations Manager
Government Affairs Manager	Regional Manager Retail
Manager Director	Regulatory Affairs Manager
Manager Government Affairs	Retail Area Manager
Manager Market Research	Retail Zone Manager
Manager Marketing	Sales Account Manager
Manager Marketing Media	Sales Manager Retail
Manager Order Processing	Sales Promotion Director
Manager Package Design	Special Events Manager
Manager Public Relations	Technical Publications Manager
Manager Retail Area	Technical Writer Manager
Manager Retail District	Zone/District Retail Manager

**Methodology/Disclaimer** (Size: 195k)

**Report Date:** 26-July-2004 [ERI's Platform Library](#). For a more technical review of competitive data, SalaryExpert recommends your review of ERI's Assessor Series.

Containing:

[Salary Assessor](#)

[Geographic Assessor](#)

[Relocation Assessor](#)

[Executive Compensation Assessor](#) [enhanced](#)

[Dictionary of Occupational Titles](#)

Most salaries are affected by an employer's : (revenue, assets, # of employees), industry (NAICS) and bonus/salary incentive policy.

**Assessor Series** reflect these factors, but the above trended OES estimate does not.

**Assessors** reflect medians and time series (not weighted averages) derived from over 10 years of surveys for over 4,000 positions. The above Series Projection reflects data from one survey. The OES, which uses very general, all-inclusive descriptions (all U.S. positions must fit into 1 of 759 job classes, all Canadian positions must fit into 1 of 47 occupational classes). OES values include bonuses and overtime. **Assessors** display this data separately. For discussions regarding the OES survey see: [ERI Newsletter](#)

**Data reported by U.S. Dept. of Labor - Occupational Employment Statistics** (used in this analysis)

For Use In	Type	Annual Mean	Level I	Level II
2001 OES Data	1	70,034	42,557	8
2002 OES Data	1	70,262	44,533	8
2003 OES Data	1	74,381	46,634	8

The above Level I or II values are to be used except for research positions found in colleges and universities, college and university operated Federally funded research and development centers, and certain research agencies.

SalaryExpert recommends careful job classification/matching confirmation. This site is 100% self-serve. If you require assistance (800) 292-2881 for a third-party consulting firm's further research and review. Their Quick-Call Reports range between \$ 189 per inquiry

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Job Class as used by ERI denotes the fact that the Occupational Employment Statistics (OES) Salary Survey begins with the premise that it will include all workers in America and reflect all jobs and positions. ERI's definition of a "position" is that it is a specific job held by an individual with specific duties, objectives, and responsibilities. A "job" is a grouping of similar positions, and a "job family" is a collection of jobs. The OES survey is best described as a collection of job families for higher levels (General Management), technical, and professional positions, although it may actually represent a "position" with lower level responsibilities (such as word processor). The "Job Class" term is used to denote that the OES job definition will include many different types of positions and job titles, including in some cases, that job's first line supervisory counterpart and paraprofessional peers. It will often represent a collection of job families (some 769 in all). Canadian data is even more broadly grouped (into 47 occupational classifications); each Canadian occupational classification has been crosswalked to each OES job group.

### JobZone

In 2003 the OES added the concept of "Job Zones" to describe positions. Job zones appear to be a recombination of the Dictionary of Occupation Titles' Specific Vocational Preparation:

SVP's Level 1, 2 and 3 =	Job Zone # 1
Level 4 and 5 =	Job Zone # 2
Level 6 =	Job Zone # 3
Level 7 =	Job Zone # 4
Level 8 and above =	Job Zone # 5

Example Job Zone # 1:

JobZone	One: Little or No Preparation Needed
Experience	No previous work-related skill, knowledge, or experience is needed for these occupations. For example, a person can become a general office clerk even if he/she has never worked in an office before.
Education	These occupations may require a high school diploma or GED certificate. Some may require a formal training course to obtain a license.
Job Training	Employees in these occupations need anywhere from a few days to a few months of training. Usually, an experienced worker could show you how to do the job.
Examples	These occupations involve following instructions and helping others. Examples include bus drivers, forest and conservation workers, general office clerks, home health aides, and waiters/waitresses.
SVP Range	Below 4.0

### Requested OES Area

Any one of 637 different OES areas covering all of the U.S. and its territories can be selected. OES Area names are those defined and used by the U.S. Government. They represent (in most cases) a collection of counties with the exception of Connecticut, New Hampshire, and Massachusetts where counties are divided. Canadian areas are those assigned by ERI utilizing the same methodology as found with U.S. data (adding 46 additional areas). These assignments and created "OES areas" were created solely by ERI with no input from Canada Statistics. In addition, ERI provides data on a state, territory, and province summation basis with those areas' codes ending with four zero digits.

### Time Series Projection vs. Reasonable Data

ERI calculates a linear regression line based upon up to three data points published by the Occupational Employment Statistics Salary Survey. The Institute uses July median collection dates for each of the 769 job groups found in 637 geographic areas. (OES data is collected throughout the year and adjusted by BLS to a central date.) ERI assumes that the last day of each month is used and projects data to the first of the next month for any inquiry, using an equation in the form of:  $Y = a + b * X$ . This equation, established from the reported weighted average of each year, is used to project means for any month (defined as the same month

as the inquiry with June 2003 data being defined as  $2003 \times 12 + 6 = 24042$  for the "x axis" coordinate.) If data is present for one year and not for another or is of a different "type", ERI assumes the projected rate will not be less than the most recent value gathered by OES for that job. No other assumption or methodology is used on this non-copyrighted data. The OES survey is complicated and all-inclusive (attempting to collapse over 16,000 jobs, 30,000 position titles, and 1,000's of professions in the United States into ~769 specific SOC/OES job groups). Users of this data are encouraged to read the methodology below (as found on the Government's Internet site) <http://www.bls.gov/oes>. ERI regresses only *like statistics* (area against area, state against state, see "Type" description below). For this reason, no data will be trended via regression analyses for 2003 if no data existed for 2001 or if the area "type" changed from one year to the next. OES changed its position/job group definitions and now uses SOC codes rather than OES codes. For 2003 projections, we utilize an annual pro-rated 2.6 – 2.8% projected salary structure advancement. (This range was derived from ERI's November Internet survey of Merit Salary Increases with 1,634 survey participants and is applied to a unique trend percentage, by position and area.)

ERI's Reasonable Data is taken from a one-time snapshot of its Salary Assessor database. Level I and Level II Estimated Overpayments are three times this amount (plus an update factor of .028 per year on a monthly basis) taken from 3 years of Level I or Level II payments.

### Survey/Type

OES reports one of four levels of data: Level: 1 = MSA, PMSA, or Balance of State Area; 2 = Contiguous Areas; 3 = Statewide; 4 = U.S. Nationwide. Overall Mean is not usable for *certification purposes* per GA Letter 2-98; Level I Mean is the weighed average of the first 1/3 of the survey sample; and Level II Mean is the weighted average of the remaining 2/3 (including all those positions that: "work with indirect supervision"). A separate database is provided by the OES for Researchers Employed by Colleges and Universities, College and University Operated Federally Funded Research and Development Centers, and Certain Research Agencies. (The data in this report are from the general OES database and not for Researchers.) Canadian data is reported by Level 1, 3, and/or 4 with data being available for most occupational classifications in almost every Census sub-division.

### Survey/Source Name

ERI's Immigration Wage/Salary Trends – OES Data Analysis of the Occupational Employment Statistics Survey ("OES") and Canada Census: ERI Economic Research Institute is a compensation and benefits research outsource. It provides research software and reports relating to area wage and salary differentials, salary survey position pay, area cost-of-living differentials, and other human resources and demographics information relating to pay and relocation planning. ERI research data provides answers to all manner of questions on market pricing, industry benchmark listings, employee transfers, salary planning, and branch pay administration. The OES survey is only one of over two thousand surveys analyzed annually by the Institute in creating its **Assessor Series**. (Canadian Census data is not used by ERI in creating the Salary Assessor as it is: 1) too broad to be useful and 2) not part of our agreement with Statistics Canada.)

### Survey Data Publishers

ERI is neither the publisher nor the conductor of this survey. The publisher and collectors of this data are the U.S. Department of Labor's Employment and Training Administration ("ETA"), the Bureau of Labor Statistics ("BLS"), and 54 State Employment Agencies ("SESAs"), all acting together to create consistent prevailing wage rates to be used as the wage component of the Bureau of Labor Statistics' expanded Occupational Employment Statistics ("OES") program. Canada data is reported as sent to ERI by Statistics Canada and is derived from Canada's 5 year census cycle.

### Data Projected/Trended to:

ERI assumes that the last day of each month is used and projects data one day short of the first of the next month for any inquiry, using an equation in the form of:  $y = a + bx$ . This equation, established from the reported weighted average of each year, is used to project means for any month. Its "x-axis" is defined as the same month as the inquiry, with 2003 data being defined as  $2003 \times 12 + 6 = 24042$  for the "x axis" coordinate for use in 2003. (Canadian 1991 and 1996 Census values are projected from an x-axis of 1990 x 12 and 1995 x 12.)

let

### SOC Job Reference Number

This is a 6 digit number assigned by OES to define the positions surveyed. For surveys conducted in the Year 2000 and thereafter (reported in the Year 2001), this number complies with NAFTA, and the Standard Occupational Code "SOC". **ERI's Platform Library** contains a crosswalk to the Occupational Employment Statistics ("OES") survey code, the DOT, Canada's NOC, the U.S. Census number, and the new SOC. For government related applications, these codes, along with Service Contract Act ("SCA") and Davis Bacon Act ("DBA") codes can be very confusing: SCA uses a different coding than either DOT, OES, the U.S. Census or Canada. For example, a Computer Programmer in the DOT is 030-167.014. In the OES it is 25105, and in the SCA it is 03101. The new SOC will replace all these codes/numbers. For this report, however, the new SOC numbers as used for the data representing 1999 as shown. For a full listing of OES Numbers and Descriptions, see <http://workforcesecurity.doleta.gov/foreign.asp>. For a crosswalk to OES, NOC, SOC and approximately 20 other coding systems, see **ERI's Platform Library's** Sources and Xwalks.

### OES Area Reference Number

This is a six digit number. The first two digits represent the state (or territory) and the latter two represent one of the 637 geographic areas that cover and include all areas within the United States and the 46 assigned Canadian areas. Metropolitan Statistical Areas are used, as are OES self-described areas such as "Northwest Washington", which includes all counties not already included in PMSAs and/or MSA. Except for the three New England states (which divide counties), all OES areas can be defined as a collection of counties and/or Canadian Census sub-divisions.

### Salary Survey Area

The collection of counties and/or sub-divisions are those found within a specified OES area. As mentioned, new areas for 2001 include Auburn, AL; Missoula, MT; and Corvallis, Oregon, while none were added in the 2001 year collection (for 2003). All counties within the U.S. are accounted for within the 633 OES areas. Within Canada, ERI has used the 302 Census sub-divisions/counties that differ in type among Provinces and in number among the three Census datasets provided. (Census sub-divisions differ only slightly each five years.) Canadian counties (a term used in certain provinces) and sub-divisions are typically much larger in geographic area than U.S. counties.

### Job Titles Included

The titles shown are those understood by ERI to be found within the Job Class Description. Selecting any one of the underlined (blue) titles below takes one to a fee-based report for the specified position. Double clicking on the active link/ titles will take one to this separate survey (not the OES) where base salary, incentive, total compensation, and survey participant estimates may be found. If a position title is in blue and underlined, sufficient sample sizes exist to report wage/salary data.

### OES Survey Job Description

Survey Descriptions are those of the OES with the additional input of qualifiers to illustrate when jobs include first-line supervision, paraprofessionals, etc. This is better described as a Job Group. For a full listing of OES Numbers and Descriptions, see **ERI's Platform Library** CD-Rom. Canada Census data came without descriptions for the 47 broad occupational categories.

### Methodology/Description

As found in this prose.

### Report Date

Report Date is the date on which the Search Report is generated on the Internet.

### ERI's Platform Library

This CD-ROM demonstration was created originally as a Windows platform from which all **Assessor Series®** software might be more effectively run. (Execution and disk speeds are enhanced.) It includes 5 non-copyrighted datasets that can be useful in compensation and benefits management including: maps,

NCS/DOT/OES/SOC data and crosswalks, HR tax codes and laws for 76 U.S. and Canadian states/provinces/territories, Census data, SEC 10-Ks, proxies, summary compensation tables, and appraisal norms, 1994 to the present. These data are free of charge; see: [www.eri.com](http://www.eri.com).

### Data as Reported

Each year ERI accesses the data files of the OES survey and extracts the reported means, Level I and Level II data for 633 geographic areas. These reflect all jobs and all geographic areas within the United States and its territories (634 areas in 1998; ERI counts states and national areas). ERI has titled the "Year 2003" data as "Data to be Used in 2003" even though it was collected in 2000-2001 and labeled as "2001" data by the OES. Many norms are reported for "contiguous areas" that may or may not be within the same State. These "contiguous areas" may change from year to year. To establish meaningful trend lines, ERI has selected to focus on the "1", "3", and "4" Types that are described below.

The definitions below are taken directly from General Administrative Letter No. 2-98, the Labor Department's Guidance on New Prevailing Wage Policies for immigration programs of October 31, 1997 as enhanced by GA Letter No. 1-00 of May 16, 2000. (We refer the reader to <http://www.eri.com/freedata/hrcodes/index.htm>).

### Type

OES reports positions within an area as either "1" (local area in which individuals may commute), "2" (contiguous/adjacent area), "3" (state-wide) or "4" (national). ERI does not necessarily show all these values and in all cases converts data to annual compensation (by multiplying hourly rates x 2080 hours). Should an area show a "4" for data in 2001, a "2" for data in 2002, and a "1" for data in the Year 2003, only the latter would be used (and the equation would be a horizontal straight line trended slightly for salary structure movement).

- 1 = MSA, PMSA, or Balance of State Area  
(local area in which an individual may commute);
- 2 = Contiguous/Adjacent Areas;
- 3 = Statewide;
- 4 = U.S. Nationwide.

If no local area data existed before the most recent year, a trended line at 3.3% movement is projected. As discussed no regression trends will be employed until ERI can regress like jobs against like jobs. Only "like areas" are trended (2 vs. 2, 3 vs. 3, 1 vs. 1, or 4 vs. 4). If the Government does not report local area data (a "1" in the most recent year), a trend line and its projection may not be reported.

### Annual Mean

The OES definition of a mean is very well defined for our purposes.

*Methodology in any type of survey must reflect the average (arithmetic mean) rate of wages, that is, the rate of wages to be determined, to the extent feasible, by adding the wages paid to workers similarly employed in the area of intended employment and dividing the total by the number of such workers. This will, by definition of the term arithmetic mean, usually require computing a weighted average.*

That said, we refer the interested reader to the concepts of winsorized means and hot decking as formerly described in the Government's technical sites (not now found, but reproduced later in this Methodology).

### Skill Level

The level of skill required by the employer for the opportunity is to be considered in making prevailing wage determinations. The OES wage survey produces two wage levels that distinguish between positions requiring significantly different degrees of skills in the occupation. The SESA will determine which of the two levels in the OES survey is appropriate, i.e., a destination must be made based on whether or not the job opportunity



involved in the employer's job offer requires skills at a Level I or a Level II, as defined below. (This text is taken directly from the U.S. Government's site in early 2001 as then found at: <http://edc.dws.state.ut.us/Skill.asp>.)

To establish uniformity among SESAs in evaluation surveys and making prevailing wage determinations within the resources available for immigration programs, prevailing wage rates for the skill levels described below should be determined in an occupation when the SESA makes a prevailing wage determination.

#### **Level I**

Beginning level employees who have a basic understanding of the occupation through education or experience. They perform routine or moderately complex tasks that require limited exercise of judgement and provide experience and familiarization with the employer's methods, practices, and programs. They may assist staff performing tasks requiring skills equivalent to a level II and may perform higher level work for training and developmental purposes. These employees work under close supervision and receive specific instructions on required tasks and result expected. Work is closely monitored and reviewed for accuracy.

#### **Level II**

Fully competent employees who have sufficient experience in the occupation to plan and conduct work requiring judgment and the independent evaluation, selection, modification and application of standard procedures and techniques. Such employees use advanced skills and diversified knowledge to solve unusual and complex problems. They may supervise or provide direction to staff performing tasks requiring skills equivalent to level I. These employees receive only technical guidance and their work is reviewed for application of sound judgement and effectiveness in meeting the establishment's procedures and expectations.

If a baccalaureate degree is normally required for entry into the occupation, the wage rate for a job offer in that occupation which requires an advanced degree (Master or Ph.D.) shall be rate for workers performing tasks requiring skills at a level II. In this case, the requirement for advanced education substitutes for the skills required at a level II. Where an advanced degree is normally required for entry into the occupation, the wage rate for a job offer in that occupation which requires such a degree shall be rate for workers performing tasks requiring skills at a level I, unless there are other requirements contained in the job offer or components thereof which require skills that are at level II. For example, a job opportunity for a librarian, an occupation for which a Master's degree is normally required for entry into the occupation, would generally be considered to require skills at a level I, unless other requirements in the job offer or components thereof require skills at a level II.

Where State licensure is required for an individual to independently perform all of the duties encompassed by the occupation, such workers shall be considered to be performing work requiring skills at a level II, unless the employer can present sufficient evidence that the alien does not, in fact, independently perform all of the duties encompassed by the occupation.

In practical terms, if an employee utilizes any discretion or works with any freedom of action, it is most likely a Level II position. We refer the reader to [www.eri.com/freedata/hrcodes/index.htm](http://www.eri.com/freedata/hrcodes/index.htm). The overall Mean is not usable for certification purposes per GA Letter 2-98; Level I Mean is the weighed average of the first 1/3 of survey sample. Level II Mean is the weighted average of the remaining 2/3 (including all those positions that "work with indirect supervision"). Canadian Level II earnings are the highest reported average for any one census sub-division within the assigned "OES" area.

#### **Sample Size**

At this time, OES does not "directly" publish the sample size of its survey, neither incumbents represented nor firms surveyed. To complete this analysis, ERI has had to estimate the number of incumbents from reported "all-over" state accumulations. One of the reasons for not reporting the number of incumbents measured (in ERI's opinion) is that the State Labor Departments (which have a funding related, OMB- BLS goal of an 80% response rate from all mailed OES survey questionnaires) have been given guidance on "mean imputation" and "nearest neighbor hot decking".

To explain, the OES survey consists of both head count and salary data collection. When wage data is

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missing and head counts exist, missing data is "imputed" (from national distributions). When head counts are not reported, but wage data exists, "hot decking" is used. The closest comparable company ("donor") is selected and then that donor's wage data is used. When both total employment and wage-employment data are missing, both hot decking and imputation are used.

ERI understands, with an 80% participation goal, why *imputation* and *hot decking* have been adopted and why sample sizes are not being reported. When this survey is mature, we would expect that mean imputation and hot decking will diminish and perhaps the population sizes will be reported.

In the interim, OES does report populations by job group class for each of the states and territories. Using ERI's **Geographic Assessor's** population statistics (collected in most part from the U.S. Census), ERI distributes the job class population for a state proportionately throughout the state based upon the population sums of the counties and cities represented. For example, Little Rock, Arkansas' OES area represents four of the most highly populated counties within the state. Consequently over 50% of the incumbents for job classes might be distributed within those four counties. Contrarily, Canadian Census data was provided to ERI with the populations measured (in a 20% sampling technique) reported by occupational classification and Census sub-division. In these cases, the values shown are a summation of the sub-divisions found within an ERI derived Canadian "OES area".

One final note: The OES survey recently broke apart the industries reporting and designated a special industry grouping. As of 1999, a separate database was provided by OES for Researchers Employed by Colleges and Universities, College and University Operated Federally Funded Research and Development Centers, and Certain Research Agencies. Data from these separate 1999 - 2001 OES database are not included in ERI surveys.

### Reliability Statistics - A Note for Expert Witnesses

In 1975, the U.S. Congress passed Federal Rule of Evidence 702 so that a threshold standard for the admission of expert witness testimony might exist in Federal Courts. Based on the concept that experts should use methodologies that are "generally accepted" by a discipline's practitioners, the rule states: "If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise." Following this, the Supreme Court issued an opinion in *Daubert v. Merrill-Dow Pharmaceuticals*, 509 U.S. 579, 113 S. Ct. 2786, 125 L.Ed.2d 469 (1993) that has become the standard for the admission of "general acceptance". In this Case (which standard is now adopted by Federal and most State Courts), the admittance of expert witness testimony and evidence required a two-step analysis: A) Evidence must be relevant, and B) Evidence must be reliable. The "relevance" is a subjective judgment but simple logic may be applied (salary survey data for use in lost wage analyses, proxy compensation data for use in maximum reasonable compensation cases, etc.) For the latter, "reliability", the Supreme Court established four separate, non-exclusive tests: 1) it can be illustrated that the theory or technique can be tested, 2) the data has been subjected to peer review and publication, 3) there is a known or potential rate of error, and (4) there a level of general acceptance in that particular discipline's community.

In March of 1999 the United States Supreme Court issued a ruling in the *Carmichael* case that further defined when a *Daubert* reliability challenge applies. In *Carmichael*, the Supreme Court ruled that reliability must be established in all types of expert testimony, both scientific and non-scientific/technical. The Court held that the role of a trial judge was that of "gatekeeper" regarding both the relevance and reliability of all expert testimony. The Court stated that the *Daubert* case was not intended to be limited to scientific cases only. Instead, it would/should apply to all fields of expert testimony. Providers of expert witness testimony must be prepared to describe why an analysis was utilized and why the analysis and data can be considered reliably sufficient. (For further discussion, see: [www.interfire.com/features/daubert.htm](http://www.interfire.com/features/daubert.htm).)

To assist subscribers in attesting to the "reliability" of data, ERI is at a disadvantage because its **Assessor Series** data projections are most often the combinations of many surveys and sources, many of which are copyrighted and licensed for confidentiality. Oftentimes ERI finds that over a hundred surveys contribute to an analysis, making our data very "robust". As the sample size increases the reliability of the data predicted becomes greater. However, for this Immigration pay analysis site, two sources may be cited, each a single

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survey: 1) the OES survey representing all jobs and areas in the U.S. and the official "head count" of those working in America and 2) Statistics Canada Census data which, like the U.S. Government's OES survey, represents "Broad Classifications for jobs (820 and 47 respectfully). Canada Census data is copyrighted and provided under contract to ERI for use with its free Immigration Pay Internet site found at [www.eri.com](http://www.eri.com). The Standard Errors and populations can be presented for these data. It is ERI's observation that by adding 2, 10, 100 (and in some cases 1,000) additional survey sources, one should only increase the reliability. Consequently, the numbers shown in the Reliability Statistics should be considered to be the minimum that exist within ERI's **Salary Assessor**. For this Internet site's presentation, however, the standard errors shown are those taken directly from OES published data; see <http://workforcesecurity.doleta.gov/foreign.asp>. A request for Canadian Census standard errors has been made and may be soon forthcoming. (If no standard error is available, ERI's dataset defaults to 00.00, 15.00, or 22.00%. Users should disregard these preliminary numbers. Please note, however, that where Canada uses only a Long Form Census Questionnaire, they do at times receive a 100% response rate for a census area. In this case, the standard error is also reported as 0%.)

### Calculation of Populations and Standard Errors

The OES survey reports three data points for each of 769 jobs in 637 geographic areas. Level I, Level II, and Average earnings can be used to create a fourth point. (One knows that Level I represents the 16.5<sup>th</sup> percentile. Level II represents the 66.5<sup>th</sup> percentile. Their sum, plus a 4<sup>th</sup> point, should average to that reported for the job class.)

In past years state numbers were all that was reported for all classes (see: <http://workforcesecurity.doleta.gov/foreign.asp>). ERI divided these among the various counties for each of the OES geographic areas. A population for each area (assuming an equal distribution within a state) was projected. Thus, data points for a known number of incumbents were constructed for the calculation of both correlation and standard error. Likewise, Canada Census data, representing 47 broad occupational classifications, were analyzed within ERI defined "OES like areas". Level I and Level II data points were defined as the high and low averages found within census sub-divisions for the "full time employed". For 2001, the OES now reports populations and standard area by state and metropolitan area; see: <http://www.bls.gov/oes>.

Historic U.S. OES datasets for the 1998, 1999, and 2000 years are found in **ERI's Platform Library**. Canada Census data would have to be provided by Statistics Canada directly, as ERI has no right to share or show these datasets. (The only time one views actual data provided by Statistics Canada is when an "OES" area is comprised of only one Census sub-division.)

In mid 2000, ERI began to report a Standard Error from the report page for each data presentation:

SYZ Position	
Reliability Statistics	
Data:	Total Compensation (Base Salary plus Bonus)
City:	Costa Mesa
Survey Area:	Costa Mesa
OES Area:	Orange County
Survey:	OES Data for 2003 collected in 2001 Canada Census 1991 and 1996
Observations	1,200
Standard Error	2.3 % (As reported)
Sources:	OES – ETA – BLS and State Agencies Statistics Canada Census 1996
See Methodology	

## Reliability Statistics Definitions

### Data

Values include incentives (see full definition above and below).

### City

Populations of employees in a job group are defined across a wide geographic area. OES reported populations are for areas from which workers may commute and typically represent much larger areas, according to the OES, than a city metropolitan area. Canadian estimates reflect a minimum of at least one census sub-division (which are, on average, much larger than any single U.S. county).

### Area

These are as defined by OES; ERI divides Canada geographically using the same methodology by which BLS/ETA defines U.S. areas.

### Survey

At the time of writing this Methodology, five complete years of OES datasets and three complete Canadian Census datasets have been analyzed (1998, 1999, 2000, 2001, 2002, 2003 and 1986, 1991, 1996 respectively). Only the Canadian 1986 Census is not included.

### Observations

OES reported job survey populations are for areas from which workers may commute and typically represent much larger areas than a city metropolitan area. As mentioned, Canadian observations reflect a minimum of at least one census sub-division. The latter population is the sum from the 1996 Census for this job class.

### Standard Error

ERI considers two different types of simple standard errors that exist among the surveys analyzed. The first is the variance found for the same job across 633 "OES" areas, representing 303 Canadian Census datasets and 3,455 U.S. state and county areas. The second is the 769 and 47 different job classes as found within any one area. Both of these standard errors illustrate a fairly wide range (see: ERI's Comments Regarding OES reported Standard Error below). A third standard error measure exists, that reported by the U.S. Government on its Internet site, the "Relative Standard Error".

Early in the 2000 Year, the OES began to report "Relative Standard Error" (RSE). To explain, the particular sample used in the OES survey is one of a large number of all possible samples of the same size that could have been selected using the same sample design. To quote the OES Technical Notes:

"Estimates derived from different samples would differ from each other. The variance of a survey estimate is a measure of the variation among the estimates from all possible samples. The standard error of a survey estimate is the square root of its variance; the relative standard error is the ratio of the standard error to the estimate itself. The sample estimate and its standard error allowed OES to construct an interval estimate with a prescribed level of confidence that the interval will include the mean value of the estimates from all possible samples.

To illustrate, if all possible samples were selected, and if each of these were surveyed under essentially the same conditions, and an estimate and its estimated sampling error were calculated from each sample, then approximately 90 percent of the intervals from 1.6 standard errors below to 1.6 standard errors above the derived estimate would include the average value of the estimates from all possible samples. This interval is called a 90-percent confidence interval.

Approximately 95 percent of the intervals from two standard errors below to two standard errors above the derived estimate would include the average value of the estimates from all possible samples. This interval is called a 95-percent confidence interval. For example, suppose that an estimated occupational employment total is 5,000 with an associated relative standard error of two percent. Based on this data, the standard error of the estimate is 100 ( $= 5,000 \times 0.02$ ) and the 95-percent confidence interval for the estimate is  $(5,000 \pm 200)$  or  $(4,800 \text{ to } 5,200)$ . This confidence interval is one of many that could be constructed based on the same sample design. Approximately

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95 percent of these confidence intervals would encompass the average value of the estimates from all possible samples."

The Relative Standard Errors shown are those reported by the OES for the job groups in each state or territory. While ERI distributes populations so that one might review the probable populations within an OES area for a particular job group, it illustrates the same Standard Error for the same job group in all OES areas within a state. (One should be able to sum all the populations within a state and see a number equal to the state population reported. The Standard Error reported would be the same for all the sub group OES areas within that state. For Canadian data, ERI has no source from which to make an estimate (no Standard Error was supplied with the three Census Years of data and values are typically shown as 0.00%). Standard errors shown are ERI estimates. ("Default fields" illustrating that these calculations have not yet been finalized are indicated as 00.00, 15.00, and/or 22.00. Users should disregard these preliminary numbers.)

Canadian Standard Errors have been supplied by Statistics Canada and reflect Standard Error of Average Income by Major Occupational Groups. Standard Error of Average Income will equal zero in two instances:

If the unrounded count is less than 10, the Average Employment Income and its Standard Error was suppressed and was reported as zero by Statistics Canada.

For remote geographic regions, including the Northwest Territories and the northern parts of some Provinces, respondents received only the 2B/2D long-form questionnaire. Consequently there was a 100% sample. In this case, there is no Standard Error and it is reported as zero.

Canadian Standard Errors were supplied in whole dollars and have been converted by dividing the average into these amounts (weighted by populations) so that a standard error can be expressed as a percentage.

#### Sources

Only the before mentioned OES and Canada Statistics data have been used to create the values shown. Should Reliability Statistics be illustrated for areas in which there exists no predicted population, it will be because that value applies to the state/territory totals.

#### ERI Comments Regarding OES Reported Standard Error

Few collected salary surveys report standard error. Since the inception of **Geographic Assessor** analyses techniques (1974), however, we have calculated a "predicted" standard error for use with all our analyses and specifically now in the **Salary Assessor**. ERI has done this for "internal reasons", as salary range distributions and seniority curve distributions utilize this measure. ERI has not reported this number because of its 7,000 subscribers, 6,900 most likely don't utilize this measure in any way. Second, if ever challenged in a Court of Law, ERI researchers would admit that they have not had access to the actual data reported upon by the various surveys and hence, cannot separate out the "double counting" that occurs when one company reports its data to more than one survey (used by ERI). Finally, when ERI enters and analyzes data, it never replicates the actual numbers reported by any survey (all entries are rounded) so that copyright violations do not occur. Should a survey report a standard error (not a typical survey practice for a rank and file survey), ERI has no right to report it in any of its research products.

The OES survey changes this, in that its data is non-copyrighted. This is new as of 2000, 2001, 2002, and 2003. These numbers (made up in part of OES seeded data and data collected from Internet respondents) are available to be reported. Finally, for management positions, the **Executive Compensation Assessor** is the largest "survey" ever reported for executive pay, dwarfing all competitors by a magnitude of 100 times. ERI can report these numbers. That being said, for the six executive positions, ERI would expect a standard error of +/- 30%, as management pay varies widely because of factors such as organization size, location, industry, and profitability. Readers should carefully review the results reported by the BLS and OES for management codes (and all other job groups). For example:

St	SOC #	RSE
70	110000	0.3 %
70	110011	0.6 %

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70 110024 0.4 %

are numbers that defy imagination (110000 are the executive positions).

That is, these results are not a distribution standard error. They are what the U.S. DOL terms a "relative standard error". We understand that a low 0.3% "relative standard error", rather than the expected 30.0%, can be reported if a survey questionnaire records all salaries greater than \$70.00 an hour as \$70.01 an hour. (If all executives measured earned more than \$70.00 an hour, one would have a standard error of 0.0%. The OES Survey Questionnaire is a "check box" type that records head counts for those who earn more than \$70 an hour.) This, however, is only part of the explanation, as all job groupings report a very low standard error. As ERI more fully understands the derivations of these numbers, we will update this Methodology.

### **ERI Statement as to the Relevance and Reliability of Data**

Relevance is totally determinable by the circumstances and situation presented. ERI provides outsourced analyses and presentations of salary, executive compensation, benefit, and cost of living survey data. (See this Methodology's Disclaimer.)

Reliability is described in a four part, non-exclusive summary to match the *Daubert* challenge:

#### **Theory/Technique Demonstrations**

Methodologies accompany each **Assessor Series**, each **SalariesReview.com** survey, and ERI's Internet presentation of OES and Canadian Census salary data used for immigration purposes as found at [www.eri.com](http://www.eri.com). These methodologies include definitions of terms, examples of calculations, and identifications of sources and data updates.

#### **Subject to Publication and Peer Review**

**Assessor Series**, **SalariesReview.com** surveys, and ERI's Internet presentation of OES and Canadian Census salary data used for immigration purposes are constantly published and updated. The former is published on a quarterly basis, and the latter two daily. Internet visits now exceed 500,000 a month to [www.eri.com](http://www.eri.com). The "soltrends" site is one of ERI's most popular.

ERI's "peers" are its competitors, those firms that also provide data analyses to their clients. Unlike ERI, which solicits an annual subscription, most compensation and benefit consulting firms charge an hourly rate for their research services. Suffice it to say, in the Year 2001, the following major consulting firms purchased LAN and multiple subscriptions so that their consultants could utilize ERI analyses: William M. Mercer, Hewitt Associates, Towers Perrin, Watson Wyatt, the Hay Group, KPMG, Baker Thomsen Associates, Arthur Andersen, PriceWaterhouseCoopers, Ernst & Young, and Deloitte. ERI data is used by these firms in their consulting for their clients. ERI data and analyses are under constant review and critique by its competitors. ERI, unlike these firms, provides no fee-for-service/time consulting.

#### **Known or Potential Rate of Error**

Each ERI **Assessor Series**, each **SalariesReview.com** survey, and ERI's Internet presentation of OES and Canadian Census salary data used for immigration purposes illustrate, via a "Reliability Statistics" link (see View | Reliability Statistics on each **Assessor**), the beginning of a statistical overview of ERI data. Statistics are reported as derived from just one survey source for all salary and compensation presentations (so that copyright restrictions are not violated). ERI accumulates many survey sources to compile its analyses. Hence the data illustrated may be, in ERI's estimate, considered to be the highest possible error and the lowest correlation that might exist with each analyses. **Assessor** data results are, by logic, more robust than the standard error displayed for this Immigration Wage/Salary Trends site.

#### **General Level of Acceptance within the Discipline's Community**

7,000 subscribers send money each year to purchase their subscriptions to ERI analyses. Each year over 80% renew their subscriptions, with many major corporations now in their second decade of subscribing. Special extracts of ERI databases are purchased annually by large organizations such as the International Churches of Christ, the Latter Day Saints, ACT, and Federal Express. U.S. Internal Revenue District Offices subscribe, as does the IRS National Appraisal Services Office (with a subscription now renewed into its second decade). ERI exhibits at major tradeshow (ACA/WaW,

AILA, SHRM, ERC, AICPA, ASA, and others). ERI is one of fourteen organizations selected as an Affinity Program Provider by the American Institute of Certified Public Accountants and has the right to utilize the AICPA logo on all its research products. ERI executive compensation extracts and data can also be found on the association for compensation professionals, WorldatWork's website: <http://www.worldatwork.org>. The Economist website, [economist.com](http://economist.com), utilizes ERI SalariesReview.com data in their [www.salaryexpert.com/economist](http://www.salaryexpert.com/economist) offerings.

## Technical Notes - Occupational Employment Statistics

### Overview

The following is a combination of 1996 -OES web site information. Technical notes found for 2003 are lacking much of the detail of early year notes. ERI has retained these earlier comments as they do much to describe the nature and conduct of this salary survey, the largest ever undertaken by any government in the history of the world.

### Employment Estimates

Employment represents the estimate of total wage and salary employment in an occupation across the industries in which it was reported. The OES survey form sent to an establishment contains between 50 and 225 OES occupations. The number of occupations listed on a form depends on the industry classification and size class of the sampled establishments. To reduce paperwork and respondent burden, no survey form contains every OES occupation.

### Wage Estimates

Wages for the OES survey are straight-time, gross pay, exclusive of premium pay. Included are base rate, cost-of-living allowances, guaranteed pay, hazardous-duty pay, incentive pay including commissions and production bonuses, and on-call pay. Excluded are back pay, jury duty pay, overtime pay, severance pay, shift differentials, non-production bonuses, and tuition reimbursements.

### Mean Annual Wage

Most employees are paid at an hourly rate by their employers and may work less than or more than 40 hours per week. The annual wage estimates in this release are calculated by multiplying the mean wage by a "year-round, full-time" hours figure of 2,080 hours per year (52 weeks by 40 hours). Thus, the annual wage estimates may not represent the actual annual pay received by the employee. There are a small number of occupations where only an annual wage figure is provided. The workers in these occupations are paid based on an annual amount, but generally work less than the usual 2,080 hours per year. Since the survey does not collect the actual hours worked, the hourly rate cannot be calculated with a reasonable degree of confidence from the annual wages. For this reason, only the annual salary is reported for these occupations. Occupations that typically have a work-year of less than 2,080 hours include musical and entertainment occupations, flight attendants, pilots, and teachers.

### Mean Hourly Wage

The Mean hourly wage is the estimated total wages for an occupation divided by its weighted survey employment.

### Median Hourly Wage

Median hourly wage is the estimated 50th percentile of the distribution of wages; 50 percent of workers in an occupation earn wages below, and 50 percent earn wages above the median wage.

## Survey Method and Reliability Statement OES Survey All-Industry Wage Rate Estimates

### General

The Occupational Employment Statistics (OES) survey is an annual mail survey measuring occupational employment and wage rates for wage and salary workers in nonfarm establishments, by industry. The OES survey samples and contacts approximately 400,000 establishments each year and, over 3 years, contacts approximately 1.2 million establishments. The reference period for each year's survey is the fourth quarter of that year. While estimates can be made from a single year of data, the OES survey has been designed to produce estimates using the full 3 years of sample. (See Estimation methodology section.) The full sample allows the production of estimates at fine levels of geography, industry, and occupational detail. BLS and the Employment and Training Administration (ETA) provide the funding for the survey. BLS provides the procedures and technical support, while the State Employment Security Agencies (SESAs) collect the data. The SESAs produce industry-specific estimates for states and local areas. BLS produces cross industry and 2- and 3- digit SIC industry estimates for the nation, states, and metropolitan statistical areas (MSAs). The OES survey defines employment as the number of workers who can be classified as full-time or part-time employees, including workers on paid vacations or other types of leave; workers on unpaid short-term absences; salaried officers, executives, and staff members of incorporated firms; employees temporarily assigned to other units; and employees for whom the reporting unit is their permanent duty station regardless of whether that unit prepares their paycheck. The survey excludes the self-employed, owners/partners of unincorporated firms, and unpaid family workers. Employees are reported in the occupation in which they are working, not necessarily for which they were trained.

### Survey Definitions and Concepts

Many of the concepts and definitions used in the OES Survey are comparable to those in the Current Employment Statistics survey, a monthly BLS payroll survey of nonagricultural establishments. Many others, however, are unique to this survey. Key definitions are as follows:

An *establishment* is an economic unit, such as a factory, mine, or store, which produces goods or services. It is generally at a single location and engaged predominantly in one economic activity.

The OES survey defines *employment* as the number of workers who can be classified as full-time or part-time employees; workers on paid vacations or other types of leave; workers on unpaid short-term absences; salaried officers, executives, and staff members of incorporated firms; employees temporarily assigned to other units; and employees for whom the reporting unit is their permanent duty station regardless of whether that unit prepares their paycheck. The survey excludes the self-employed, owners/partners of unincorporated firms, and unpaid family workers. Employees are reported in the occupation in which they are working, not necessarily for which they were trained.

*Employment* represents the estimate of total wage and salary employment in an occupation across the industries in which it was reported. The OES survey form sent to an establishment contains between 50 and 225 OES occupations. The number of occupations listed on a form depends on the industry classification and size class of the sampled establishments. To reduce paperwork and respondent burden, no survey form contains every OES occupation.

The OES classification system uses seven *occupational divisions* to categorize workers into one of 750 (or 959 according to ERI's count) detailed occupations. The seven divisions are as follows:

- Managerial and Administrative;
- Professional, Paraprofessional, and Technical;
- Sales and Related;
- Clerical and Administrative Support;
- Service;
- Agricultural, Forestry, and Fishing; and
- Production, Construction, Operating,  
Maintenance, and Material Handling.

*Wages* for the OES survey are straight-time, gross pay, exclusive of premium pay. Included are base rate, cost-of-living allowances, guaranteed pay, hazardous-duty pay, incentive pay including commissions and production bonuses, and on-call pay. Excluded are back pay, jury duty pay, overtime pay, severance pay, shift differentials, non-production bonuses, and tuition reimbursements.



The OES survey collects wage data in 11 intervals. Employers report the number of employees in an occupation per each wage range. The wage intervals (for 1998) were as follows:

Interval	Hourly Wages	Annual Wages
Range A	Under 6.75	Under \$14,040
Range B	\$6.75 to \$8.49	\$14,040 to \$17,659
Range C	\$8.50 to \$10.74	\$17,660 to \$22,359
Range D	\$10.75 to \$13.49	\$22,360 to \$28,079
Range E	\$13.50 to \$16.99	\$28,080 to \$35,359
Range F	\$17.00 to \$21.49	\$35,360 to \$44,719
Range G	\$21.50 to \$27.24	\$44,720 to \$56,679
Range H	\$27.250 to \$34.49	\$56,680 to \$71,759
Range I	\$34.50 to \$43.74	\$71,760 to \$90,999
Range J	\$43.25 to \$55.49	\$91,000 to \$115,439
Range K	\$55.50 to \$69.99	\$115,440 to \$145,599
Range L	\$70.01 and over	\$145,600 and over

The OES survey collects wage data in 12 intervals. Employers report the number of employees in an occupation per each wage range. The wage intervals used for the 1999 survey are as follows:

*Annual wage:* Most employees are paid at an hourly rate by their employers and may work less than or more than 40 hours per week. The annual wage estimates in this release are calculated by multiplying the mean wage by a "year-round, full-time" hours figure of 2,080 hours per year (52 weeks by 40 hours). Thus, the annual wage estimates may not represent the actual annual pay received by the employee. There are a small number of occupations where only an annual wage figure is provided. The workers in these occupations are paid based on an annual amount, but generally work less than the usual 2,080 hours per year. Since the survey does not collect the actual hours worked, the hourly rate cannot be calculated with a reasonable degree of confidence from the annual wages. For this reason, only the annual salary is reported for these occupations. Occupations that typically have a work-year of less than 2,080 hours include musical and entertainment occupations, flight attendants and pilots, and teachers.

*Hourly versus annual wage reporting:* For each occupation, respondents are asked to report the number of employees paid within specific wage intervals. The intervals are defined both as hourly rates and the corresponding annual rates, where the annual rates are constructed by multiplying the hourly wage rate for the interval by the typical work year of 2,080 hours. In reporting, the respondent can reference either the hourly or the annual rate, but is instructed to report the hourly rate for part-time workers.

The *Unemployment Insurance (UI) Address File* is a micro-level employer file prepared quarterly by each State's Employment Security Agency and submitted to the Bureau of Labor Statistics. For 1997, the file from the third quarter of 1996 is used as a sampling frame, while the fourth quarter of 1997 is used as a source of population values for employment.

*Industry classifications* are based on the 1987 *Standard Industrial Classification Manual*, Office of Management and Budget, 1987. Industry is classified on the basis of the major product or activity of the establishment, as determined by total sales or receipts of the calendar year prior to classification.

### Scope of Survey

The OES survey currently uses the Standard Industrial Classification (SIC) system to classify all establishments. An establishment is defined as an economic unit that processes goods or provides services, such as a factory, mine, or store. The establishment is generally at a single physical location and is engaged primarily in one type of economic activity. The scope of the survey includes establishments in SIC codes 07, 10, 12 to 17, 20 to 42, 44 to 65, 67, 70, 72, 73, 75, 76, 78 to 84, 86, 87, and 89. This scope covers agricultural services; mining; construction; manufacturing; transportation and public utilities; wholesale and retail trade; finance, insurance, and real estate; and services. Data for the postal service (SIC code 43) and federal government are universe counts obtained from the Office of Personnel Management.

States' Unemployment Insurance (UI) files provide the universe from which the OES survey draws its sample. The employment benchmarks are obtained from reports submitted by employers to the UI program. In some nonmanufacturing industries, supplemental sources are used for establishments not reporting to the UI program. The OES survey sample is stratified by area, industry, and size class. Size classes are defined as follows:

UI reporting units with 250 or more employees are sampled with certainty across a 3-year period. Many States sample one-third of their certainty units each year. However, there are some States that sample more than one-third of their certainty units during one survey year.

In 1997 establishments in size classes 2 to 6 were selected based on a probability sample. The sampling weights in size class 2 were adjusted to account for the employment in size class 1. In 1998, the OES survey began sampling establishments in size class 1; thus, establishments in all size classes are now represented in the probability sample.

**New Occupational Classification Standards for 1999:** In 1999 the OES survey began using the Office of Management and Budget's new occupational classification system -- the Standard Occupational Classification System (SOC). The SOC system is the first OMB required occupational classification system for Federal agencies. The OES survey uses 22 major occupational groups from the SOC to categorize workers in one of almost 770 detailed occupations. Previous years' data were cross-walked to the new classification system when possible and used in producing wage estimates for these occupations. Of the occupations listed in Table 1, wages for 374 of the matched occupations are estimated using data from the 1997, 1998, and 1999 surveys. The remaining occupations are either new SOC occupations, or are slightly different from similar occupations in the old OES structure; wages for these occupations are estimated from a single year of data only. In order to maintain employment additivity, all occupational employment estimates are based only on the data collected in the 1999 survey.

The major groups of the new SOC system are as follows:

- \* Management occupations
- \* Business and financial operations occupations
- \* Computer and mathematical occupations
- \* Architecture and engineering occupations
- \* Life, physical, and social science occupations
- \* Community and social services occupations
- \* Legal occupations
- \* Education, training and library occupations
- \* Arts, design, entertainment, sports, and media occupations
- \* Healthcare practitioners and technical occupations
- \* Healthcare support occupations
- \* Protective service occupations
- \* Food preparation and serving related occupations
- \* Building and grounds cleaning and maintenance occupations
- \* Personal care and service occupations
- \* Sales and related occupations
- \* Office and administrative support occupations
- \* Farming, fishing, and forestry, occupations
- \* Construction, and extraction occupations
- \* Installation, maintenance, and repair occupations
- \* Production occupations
- \* Transportation and material moving occupations
- \* Military specific occupations (not surveyed in OES).

The reference date of the 1997 survey was the week that included October 12, November 12, or December 12 of 1997. The reference date for a particular establishment in this survey is dependent on its two-digit SIC code. See the table below.

Reference Date	Industries Surveyed
October 12	07, 15-17, 41, 46, 50-62, 67, 70, 73, 79, 84
November 12	26-28, 30, 35, 36, 40, 42, 45, 47, 48, 63-65, 75, 76, 78, 80, 81, 83, 86, 87, 89
December 12	10, 12-14, 20-25, 29, 31-34, 37-39, 44, 49, 72, 82, and state and local governments

### Sampling Procedures

The sampling frame for this survey was the list of establishments which reported to the state Unemployment Insurance (UI) files for the two-digit SICs listed above. For the 1997 survey, the frame's reference date was the third quarter of 1996. This frame was supplemented with a list supplying establishment information on Railroads (SIC 401).

Establishments in the universe were stratified by Metropolitan Statistical Area (MSA), three-digit SIC, and size of firm (i.e., size class). Size classes were defined as follows:

Size class	Number of Employees
1	1 to 4
2	5 to 9
3	10 to 19
4	20 to 49
5	50 to 99
6	100 to 249
7	250 and above

In 1996 and 1997, establishments in size classes 2 to 6 were selected based on a probability sample. The sampling weights in size class 2 were adjusted to account for the employment in size class 1. In 1998, the OES Survey began sampling establishments in size class 1; thus, establishments in all size classes are now represented in the probability sample. UI reporting units with 250 or more employees are sampled with certainty across the three year cycle of the survey. Approximately one third of these units are selected within each MSA/SIC/Size class each year. The above allocation resulted in a total initial sample size of 409,347. Then 408,801 UI reporting units or establishments were sampled for 1996 and 1997. The combined initial sample size for 1996 and 1997 is 811,945 UI reporting units or establishments. (Note that the combined sample size is not a simple sum of the two year's samples. Some state government establishments are included in the survey each year. In the tabulations for the combined survey these establishments are only included once, from the most recent year. Federal government units are also included in the combined tabulation.)

### Method of Collection

Survey schedules were initially mailed to virtually all sampled establishments. Personal visits, however, were made to some of the larger establishments.

Two additional mailings were sent to non-responding establishments at approximately three week intervals. Telephone follow-ups and, in some cases, personal visits were made to non-respondents considered critical to the survey because of their size.

### Response

Subsequent to the close-out date for National estimates, additional data were collected by the states and used to prepare their own estimates. Consequently, the response rates in most states are higher than the response rate used to develop estimates of all-industry wage rates for each MSA.

### Estimation Methodology

Employment represents the estimate of total wage and salary employment in an occupation across the industries in which it was reported. The OES survey form sent to an establishment contains between 50 and 225 SOC occupations selected on the basis of the industry classification and size class of the sampled establishments. To reduce paperwork and respondent burden, no survey form contains every SOC occupation. Thus, data for specific occupations are collected primarily from establishments within industries that are the predominant employers of labor in those occupations.

Wages for the OES survey are straight-time, gross pay, exclusive of premium pay. Base rate, cost-of-living allowances, guaranteed pay, hazardous-duty pay, incentive pay including commissions and production

bonuses, tips, and on-call pay are included. Excluded are back pay, jury duty pay, overtime pay, severance pay, shift differentials, nonproduction bonuses, and tuition reimbursements.

Mean wage is the estimated total wages for an occupation divided by its weighted survey employment. With the exception of the upper open-ended wage interval, interval L (\$70.00 and over), a mean wage value is calculated for each wage interval based on occupational wage data collected by the Office of Compensation and Working Conditions. The mean wage value for the upper open-ended wage interval is its lower bound (Winsorized mean). These interval mean wage values are then attributed to all workers reported in the interval. For each occupation, total weighted wages in each interval are summed across all intervals and divided by the occupation's weighted survey employment.

Annual wage: Many employees are paid at an hourly rate by their employers and may work less than or more than 40 hours per week. The annual wage estimates in this release are calculated by multiplying the mean hourly wage by a "year-round, full-time" hours figure of 2,080 hours per year (52 weeks by 40 hours). Thus, the annual wage estimates may not represent the actual annual pay received by the employee if they work fewer than 2,080 hours per year. There are a small number of occupations in this release where only an annual wage figure is provided; the workers in these occupations are generally paid on an annual basis, and their annual wages have been directly calculated from the reported survey data.

Hourly versus annual wage reporting: For each occupation, respondents are asked to report the number of employees paid within specific wage intervals. The intervals are defined both as hourly rates and the corresponding annual rates, where the annual rates are constructed by multiplying the hourly wage rate for the interval by the typical work year of 2,080 hours. In reporting, the respondent can reference either the hourly or the annual rate, but is instructed to report the hourly rate for part-time workers.

There are workers in some occupations who are paid based on an annual amount, but generally work less than the usual 2,080 hours per year. Since the survey does not collect the actual hours worked, the hourly rate cannot be calculated with a reasonable degree of confidence from the annual wages. For this reason, only the annual salary is reported for these occupations. Occupations that typically have a work-year of less than 2,080 hours include musical and entertainment occupations, pilots and flight attendants, and teachers.

The OES survey samples approximately 400,000 establishments each year and, over a 3-year period, contacts approximately 1.2 million establishments. Each single-year sample represents a one-third sample of both the certainty and non-certainty strata for the full 3-year sample plan. While estimates can be made from a single year of data, the OES survey has been designed to produce estimates using the full 3 years of data.

The full 3-year sample allows the production of estimates at fine levels of geography, industry, and occupational detail, while estimates using any one year of data would be subject to a higher sampling error (due to the smaller sample size) and the limitations associated with having only 1/3 of the units from the certainty strata. Producing estimates using the 3 years of sample data provides significant sampling error reductions (particularly for small geographic areas and occupations); however, it also has some quality limitations in that it requires the adjustment of earlier years' data to the current reference period—a procedure referred to as "wage updating."

Wage Updating: As noted above, combining multiple years of data has both statistical advantages and limitations. Significant reductions in sampling error can be achieved by taking advantage of 3 years of data, which covers over 70 percent of the employment in the United States. This feature is particularly important in improving the reliability of estimates for small domains in the population (that is, wage and employment estimates for detailed occupations in small areas). Combining multiple years of data also has been necessary to obtain full coverage of the certainty strata (that is, large employers with 250+ employment).

Starting with the 1997 estimates, the OES program has used the over the year fourth-quarter wage changes from the Bureau's Employment Cost Index to adjust prior year survey data before combining it with the current year data. The wage updating procedure assumes that each occupation's wage, as measured in the earlier years, moves according to the average movement of its occupational division and that there are no major geographic or detailed occupational differences. This may not be the case. The Bureau has conducted research over the past several years on the accuracy of the ECI wage-updating method versus other modeling approaches. Current research results support the continued use of the ECI wage-updating methodology.

1999 OES survey estimates: Beginning in 1999 the OES survey began using an occupational coding structure based on OMB's Standard Occupational Classification System. For 374 occupations that were one-to-one matches or direct aggregations between the two coding systems, the 1999 OES survey wage estimates are developed from the full three years of OES survey data. Wages for fifteen occupations that are one-to-one matches but had significant employment in the new wage range for workers earning \$70.00 per hour and above are estimated using the 1999 survey data only. The remaining occupational wage estimates are developed from the 1999 survey data alone, which covers approximately 400,000 establishments. The combined 1997, 1998, and 1999 data cover approximately 1.2 million sample units. Occupations where the wage is estimated using three years of data are footnoted in Table 1. The 1999 employment estimates for all

occupations are developed using the 1999 data alone.

The 1999 estimates use the wage-updating methodology introduced in 1997, which uses the over the year fourth-quarter wage changes from the Bureau's Employment Cost Index to adjust prior years' data before combining them with data from the current year. In addition, the 1999 estimates use the estimation methodology introduced in 1997, which uses a "nearest neighbor" imputation approach for nonrespondents and applies employment benchmarks at a detailed MSA by 3-digit industry and broad size class level. Another challenge in combining data has been the 1999 transition to a new SOC-based OES occupational coding system. 1997 and 1998 data were cross-walked to the new SOC based classification system. Although most of the old OES occupations can be cross-walked to a counterpart in the new system, many of the relations between the two coding systems are not one-to-one. Many old OES occupations are cross-walked to residual occupations, meaning that occupation is no longer surveyed as a detailed occupation. Likewise, there are occupations in the new system that were not surveyed in the old system and thus there is only one year's worth of data for those occupations. For more information about the SOC, please see the BLS website at <http://www.bls.gov/oes>.

The OES survey samples approximately 400,000 establishments each year and, over a 3-year period, contacts approximately 1.2 million establishments. Each single-year sample represents one-third of both the certainty and non-certainty strata for the full 3-year sample plan. While estimates can be made from a single year of data, the OES survey has been designed to produce estimates using the full 3 years of data. The full 3-year sample allows the production of estimates at fine levels of geography, industry, and occupational detail, while estimates using any one year of data would be subject to a higher sampling error due to the smaller sample size and the limitations associated with having only 1/3 of the certainty units. Producing estimates using 3 years of sample data provides significant sampling error reductions (particularly for small geographic areas and occupations); however, it also has some quality limitations in that it requires the adjustment of earlier years' data to the current reference period--a procedure referred to as "wage updating."

The 1996 OES survey estimates, which were published in December 1997, were from the first year of the new OES wage survey and were developed using only a single year (i.e., 400,000 sample units) of data. The initial estimation methodology used a weighting-class adjustment procedure for non-respondents and an employment benchmark at the state/industry level. Since multiple years of data were not available for the 1996 estimates, the estimation procedure did not involve "wage updating."

The 1997 OES survey estimates represent the second year of OES estimates and have been developed using both the 1996 and 1997 surveys. The 1997 estimates also represent the first year a "wage-updating" methodology was used to develop the OES survey estimates. In addition to the wage-updating procedure, the 1997 estimates use an improved estimation methodology, which utilizes a "nearest neighbor" imputation approach for non-respondents and applies employment benchmarks at a detailed MSA by 3-digit industry and broad size class level. A variant of the imputation procedure is also used to account for item non-response. (Note: Because of the difference in estimation methods for these first 2 years of OES estimates, the data from 1997 are not strictly comparable with those published from 1996, as is the case for 1999 data to be used in the Year 2000.)

The *wage-updating procedure* is used to adjust prior year wages to reflect increases between the previous data and current year data. This aging of wage data is accomplished through a multiplicative factor ( $1.000 + \text{rate of change}$ ) applied to prior year wages during the estimation process. For the 1997 estimates, the OES program has used the over-the-year fourth quarter wage changes from the Bureau's Employment Cost Index to adjust the 1996 survey data before combining it with this year's fourth quarter 1997 data. The ECI over-the-year wage changes provide the rate of change from the fourth quarter of 1996 to the fourth quarter of 1997 for the nine occupational divisions for which ECI estimates are available. Such a procedure assumes that each occupation's wage moves according to the average movement of its occupational division and that there are no significant geographic differences. Since this may not be the case, the wage-updating procedure has some quality limitations.

The *hot deck (nearest neighbor) imputation procedure* imputes for unit non-response. This type of non-response occurs when a unit reports no employment data. In hot decking, units in the sample are stratified into 'year/State/4-digit industry/size class' cells. Within each cell, a donor (i.e., responding unit) is selected to represent each non-respondent under the proviso that a donor cannot be selected twice. The sampling frame employment is used to match donors with non-respondents. Once a donor and non-respondent are matched, the occupational employment totals from the donor are copied over to the non-respondent. In the event that a

donor is not available at the 'year/State/4-digit industry/size class' cell level, the procedure advances to succeeding higher level cells until a donor is found.

Occasionally a responding establishment may provide employment information, but omit wage distribution information for selected occupations. The OES survey currently uses a variation of the mean imputation procedure to impute for item non-response. This type of non-response occurs when a unit reports the total employment for its occupations but not the corresponding employment by wage intervals. In this procedure, units in the sample are stratified into 'year/MSA/3-digit industry/size class' cells. A wage-employment distribution is then calculated for those occupations with missing wage-employment based on the usable data in the cell. Missing wage-employment is imputed using the just calculated wage-employment distribution to prorate the total employment of those occupations with the missing data.

A separate ratio estimator is used to develop estimates of occupational employment in each wage interval. The auxiliary variable is the population value of total employment obtained from the refined Unemployment Insurance files for the 1997 reference month. Within each MSA, the estimated employment for an occupation at the reported three-digit SIC/wage interval level was calculated by multiplying the weighted employment by its ratio factor. The estimated employment for an occupation at the all-industry level was obtained by summing the occupational interval employment estimate across all industries within an MSA reporting that occupation. A further adjustment to each occupational employment total was made as described in the Reliability of the Estimates section. This adjustment did not affect the mean or median wage rates. The employment and wage data for federal government workers in each occupation were added to the survey derived data.

A *mean wage* and a *median wage* are calculated using wage data from establishments in the industries that reported employment for an occupation.

*Mean wage* is the estimated total wages for an occupation divided by its weighted survey employment. For the upper open-ended wage interval, a Winsorized mean procedure is used to estimate the mean wage. That is, the mean wage value for the upper open-ended wage interval is set at its lower bound (\$60.01). For the other intervals, a mean wage value is calculated based on occupational wage data collected by the Office of Compensation and Working Conditions. These interval mean wage values are then attributed to all workers reported in the interval. For each occupation, total weighted wages in each interval (i.e., mean wages times weighted employment) are summed across all intervals and divided by the occupation's weighted survey employment to obtain a mean wage.

*Median wage* is the estimated 50th percentile of the distribution of wages; 50 percent of workers in an occupation earn wages below, and 50 percent earn wages above the median wage. The wage interval containing the median wage is located using a cumulative frequency count of employment across wage intervals. After the targeted wage interval is identified, the median wage rate is then estimated by a linear interpolation procedure.

### Reliability of the Estimates

The occupational wage rates in this report are estimates derived from a sample survey. Two types of errors are possible in an estimate based on a sample survey - sampling error and nonsampling error. Sampling error occurs because the observations are based on a sample, not on the entire population. Nonsampling error is due to response, non-response, and operational errors.

*Nonsampling Errors* - Estimates are subject to various response, non-response, and operational errors during the survey process. Sources of possible errors are data collection, response, coding, transcription, data editing, non-response adjustment, and estimation. These errors would also occur if a complete census were conducted under the same conditions as the sample survey. Explicit measures of their effects are not available. However, it is believed that the important response and operational errors were detected and corrected during the review and validation process.

The employment total and wage data for the occupation reflect only those industries that reported the occupation. This occurs primarily in those industries where the occupation appeared on the survey form. Since every occupation does not appear on every industry-specific form, there may be a bias in the employment and wage data for some occupations. The extent of this bias is unknown.

Another source of potential bias is the limitations placed on the size of the benchmark factors. A benchmark factor is the ratio of a known employment value to a sample-derived employment estimate. This factor is used to make a post-stratification adjustment that makes the total weighted employment estimate at the state / three-digit SIC industry / Metropolitan Statistical Area (MSA) / employment size class level match the population employment at that level. The source of the population employment data is the states' Quarterly Unemployment Insurance files for the reference period of the survey. In cases where a small sample was taken, the ratio factor can become large or small. In order to prevent an establishment from contributing either too much or not enough to an MSA's wage rate estimates, the benchmark factor was not allowed to exceed a predetermined value. The total employment count for those MSAs where the benchmark factor was limited by this ceiling will be biased to a small degree in those strata. The employment not assigned to those strata because of this ceiling was then distributed across the other MSAs in the state / three-digit industry, so that the estimated employment of the State / three-digit industry would match the known employment totals at that level.

*Sampling Errors*--The particular sample used in this survey is one of a large number of possible samples of the same size that could have been selected using the same sample design. For example, occupational wage rate estimates derived from the different samples will differ from one another. The deviation of a sample estimate from the average of all possible sample estimates is called the sampling error. The standard error of an estimate is a measure of the variation of estimates across all possible samples and thus is a measure of the precision with which an estimate from a particular sample approximates the average result of all possible samples. Estimates of sampling errors for the occupational employment and mean wage rate estimates at the National level are available from BLS-Washington.

### Quality Control Measures

Quality control measures implemented in the OES survey include:

- review of the specific occupations to be collected for each industry, and those to be collected in residual categories
- creating and validating the sample frame for all states at BLS-Washington
- allocating and selecting the sample for all states at BLS-Washington
- follow up solicitations of non-respondents (especially critical non-respondents)
- review of survey schedules to verify the accuracy and reasonableness of the reported data
- adjustments of atypical reporting units on the data file
- validation of the non-response adjustment factors
- validation of the population employment and ratio factors
- standardized data processing programs and activities

### Frequently Asked Questions

The following prose sections have been taken directly from the U.S. Government's non-copyrighted site describing this survey.

#### What does the OES program produce?

The OES program produces employment and wage estimates for over 750 occupations. These are estimates of the number of people employed in certain occupations, and estimates of the wages paid to them. These estimates are available for the nation as a whole, for individual States, and for selected metropolitan areas; national occupational estimates for specific industries are also available.

#### What basic concepts are essential to understanding the OES survey?

'Establishment,' 'Industry,' and 'Occupation' are three key concepts.

- An establishment is the physical location of a certain economic activity, for example, a factory, mine, store, or office. Generally a single establishment produces a single good or provides a single service. An enterprise (a private firm, government, or non-profit organization)

could consist of a single establishment or multiple establishments. A multi-establishment enterprise could have all its establishments in one industry (i.e., a chain), or could have various establishments in different industries (i.e., a conglomerate).

- An industry is a group of establishments that produce similar products or provide similar services. For example, all establishments that manufacture automobiles are in the same industry. A given industry, or even a particular establishment in that industry, might have employees in dozens of occupations. The Standard Industrial Classification (SIC) system groups similar establishments into industries.
- An occupation is a set of activities or tasks that employees are paid to perform. Employees that perform essentially the same tasks are in the same occupation, whether or not they are in the same industry. Some occupations are concentrated in a few particular industries, other occupations are found in the majority of industries.

**What are the differences between the Bureau's Occupational Employment Statistics (OES) wage estimates and National Compensation Survey (NCS) wage estimates?**

Both the OES and the NCS programs provide information on wages and salaries by occupation, but they have different strengths.

- The OES survey provides earnings on an hourly and annual basis, including mean and median earnings for all areas—national, State, and MSAs—as well as 10th, 25th, 75th, and 90th percentile wage rate estimates for the nation. The NCS survey also provides mean earnings on an hourly and annual basis for all surveys and earnings distributions by the 10th, 25th, 50th, 75th, and 90th percentiles for some surveys. The OES program is the larger survey and can provide a greater range of occupations and areas, while the NCS program is conducted by personal visit and can provide greater depth by obtaining occupational work level.

The NCS occupational work level is based on the duties and responsibilities of the job. An architect, for example, who directs a major project would typically be more highly compensated than an architect preparing a small part of a project under direct supervision.

- The OES program provides information for more occupations (about 700 occupational classifications compared with about 450 occupational classifications in the NCS). The NCS program, on the other hand, provides information on the wages for the occupations it covers at specific levels of work rather than just an average for all workers in the occupation.
- The OES program provides information for the nation, for States, and for 334 metropolitan areas, as well as for the District of Columbia, Puerto Rico, the Virgin Islands, and Guam. The NCS program provides information for the nation, for 81 metropolitan areas and 73 non-metropolitan counties representing the U.S. and for the 9 Census divisions (although not all areas have information for all occupations).

The metropolitan definitions differ for the two programs: Where an area has both a primary metropolitan statistical area (PMSA) and a broader consolidated metropolitan statistical area (CMSA), the OES program uses the PMSA and the NCS program uses the CMSA.

- If you want wage estimates for pay-setting purposes, and want to set pay according to the level of work that is being performed, the NCS estimates are the better choice. If you need to know the general wage profile for a large number of occupations in a large number of areas, the OES estimates are the better choice. If you need information by State, you will need to use OES estimates.
- Both surveys include full- and part-time workers who are paid a wage or salary. The NCS program obtains actual work schedules from the establishment, while the OES program assumes standardized schedules. Thus, if you need information on occupations in which the work schedule is atypical, you need to exercise caution in



using the OES estimates.

- Both surveys exclude agriculture, fishing and forestry industries and private household workers; the OES program includes federal civilian employment, except for some national security agencies, while the NCS program excludes federal government employment.
- The OES program includes establishments with 5 or more workers, while the NCS program only includes establishments with at least 50 workers. Thus, if you want pay in a broader range of workplaces, use the OES estimates; if you want information about pay in larger establishments, use the NCS estimates.

#### **Does the BLS have OES estimates for specific industries?**

Yes, it has OES estimates, including a sample of national industry-specific occupational employment and wage estimates. The BLS produces national occupational employment and wage estimates for most 2- and 3-digit SIC industries. These estimates are available by request; there may be a charge for these data.

Industry-specific OES estimates for individual States may be available from the States' Labor Market Information (LMI) or Research, Analysis, and Statistics offices which are part of their State Employment Security Agencies (SESA's). Availability, format and medium of the data vary by State. To obtain OES data for a particular State, please contact the appropriate State office.

#### **Does the BLS have OES estimates for individual States?**

Yes, it has OES estimates, including state-wide cross-industry occupational employment and wage estimates for individual States. Additional information may be available from the State Employment Security Agency (SESA) in each State. Format and medium of the data vary by State. To obtain additional estimates for a particular State, contact the appropriate State office.

#### **Does the BLS have OES estimates for metropolitan areas?**

Yes, it has OES estimates, including cross-industry occupational employment and wage estimates for metropolitan areas.

Metropolitan areas comprise one or more entire counties, except in New England, where cities and towns are the basic geographic units. Where metropolitan areas are combined to form consolidated metropolitan areas (CMSA's) the component metropolitan areas are designated primary metropolitan statistical areas (PMSA's). Metropolitan areas that are not combined to form CMSA's are designated metropolitan statistical areas (MSA's). There is more information about metropolitan areas on the Census Bureau web site.

The OES program produces cross-industry occupational employment and wage estimates for MSA's and PMSA's. The OES program does not produce estimates for CMSA's. The metropolitan area definitions used to produce OES estimates are those that were in effect during the year prior to the survey year. The definitions of some metropolitan areas or their components may have been changed since the current OES estimates became available.

#### **What is the difference between 'Occupational Employment and Wage estimates' and 'Industry Staffing Pattern estimates'?**

The Occupational Employment Statistics program produces 'Occupational Employment and Wage estimates' and 'Industry Staffing Pattern estimates'-- both of which consist of employment and wage estimates by occupation. The 'Occupational Employment and Wage estimates' consist of national, State and metropolitan area estimates. The 'Industry Staffing Pattern estimates' contain only national estimates.

The main difference is that the 'Occupational Employment and Wage estimates' are cross-industry estimates, and the 'Industry Staffing Pattern estimates' are industry-specific estimates.

- Cross-industry estimates are calculated with data collected from establishments in all the

industries in which a particular occupation is surveyed. (Not every occupation is surveyed

- in every industry.) For example, the cross-industry occupational employment estimate for mechanical engineers is the sum of all the industry-specific estimates for mechanical engineers. Likewise, cross-industry occupational wage estimates for mechanical engineers are calculated from data collected from establishments in all the industries where mechanical engineers are surveyed.
- Industry-specific estimates are calculated with data collected from establishments in a particular industry. Industry-specific occupational employment estimates are based on the number of people employed in that occupation in a particular industry. Similarly, the industry-specific occupational wage estimates are calculated with data from establishments in one particular industry. Since different industries employ people in different occupations, the occupations in the staffing pattern for one industry will not be the same as the occupations in the staffing pattern for another industry.

Prior to 1996, national industry-specific estimates of occupational employment were the only OES estimates produced by the BLS; wage estimates were not produced.

#### **Why are an occupation's cross-industry employment and wage estimates calculated from 'industries in which it was surveyed'?**

OES estimates are calculated from data that employers provide by filling out survey forms. There are different survey forms for different industries. The occupations listed on survey forms vary depending on the industry and size of establishment. No survey form contains all 750+ OES occupations, because no industry employs workers in every occupation. Survey forms contain between 50 and 225 occupations. Customizing the survey forms reduces paper work and respondent burden, making the survey form easier for employers to fill out. This increases the response rate and allows the OES program to produce better estimates.

When an occupation's industry-specific employment estimates are summed to produce its cross-industry employment estimates, only those industry-specific estimates from industries where the occupation appeared on the survey forms are included in the summation. Similarly, the calculation of an occupation's cross-industry wage estimates is made with data from industries where that occupation was surveyed. There exists the possibility that some employment in a particular occupation could exist in an industry where it was unexpected and therefore, not surveyed -- in such cases it would be missed and not included in the calculation of that occupation's employment and wage estimates.

#### **Why are OES estimates from the 1996 and 1997 surveys not comparable (etc. to Year 2000)?**

The 1997 OES employment and wage estimates presented on this web site are based on data from both the 1996 and 1997 OES surveys. The two years of sample responses for employment and wage data have been combined to produce the 1997 estimates. The 1996 wage data have been adjusted to the 1997 reference period by using the over-the-year wage change in the most applicable Employment Cost Index (ECI) series. The employment estimates from 1996 and 1997 have been adjusted to the full universe counts for the 1997 survey reference period based on the Covered Employment and Wages (ES-202) program. Furthermore, the estimation methodology has been improved since the 1996 estimates were prepared. Therefore the 1997 OES estimates are not strictly comparable to the 1996 OES estimates, and the Year 2000 data (collected in 1998 and 1999) are not strictly comparable either.

#### **Why does the OES survey produce estimates from more than one year's data?**

Significant reductions in sampling error can be achieved by taking advantage of a full three years of data, covering 1.2 million establishments and over 70 percent of the employment in the United States. This feature is particularly important in improving the reliability of estimates for detailed occupations in small geographical areas. Combining multiple years of data is also necessary to obtain full coverage of establishments with 250 or more workers since, in order to reduce respondent burden, the OES survey samples them only once every three years. While there are significant advantages, there are

also limitations associated with this estimation procedure in that it requires "updating" for the earlier years of data.

In 1999, the OES began using the new OMB Standard Occupational Classification (SOC) system, which is not fully compatible with the OES occupational classification system used in previous year's surveys. The 1999 employment estimates were calculated using data collected in 1999. Wage estimates for the occupations that did not change in the new SOC system are estimated using data from 3 years of data (collected in 1997, 1998, and 1999) to produce estimates with smaller sampling errors. The 1997 and 1998 wage data have both been adjusted to the 1999 reference period using the over-the-year wage change in the most applicable Employment Cost Index series. Wage estimates for SOC occupations that are new are not directly comparable to occupations in the old occupational classification system were estimated with the single year of data.

The 1998 OES estimates have a fourth-quarter 1998 reference period and are based on information from the 1996, 1997, and 1998 surveys. The employment data from 1996, 1997, and 1998 have been adjusted to the full universe count for the 1998 survey reference period based on the Covered Employment and Wages (ES-202) program. (Estimates for New Jersey were adjusted to second quarter 1998, since data for fourth quarter 1998 were unavailable.) The 1996 and 1997 wage data have both been adjusted to the 1998 reference period using the over-the-year wage change in the most applicable Employment Cost Index series.

**Does the OES survey produce estimates by age, race, sex, or educational attainment?**

No. The OES survey program does not gather demographic information. However, the BLS' Labor Force Statistics from the Current Population Survey program provide information on employment, unemployment, and weekly earnings, by a variety of demographic characteristics.

**Does the OES survey produce estimates by size of establishment?**

No. The OES survey does not produce estimates based on total establishment employment. Information pertaining to the number of establishments in various employment size classes and their aggregate employment (economy wide and by industry) can be obtained by contacting the staff at the 'ES-202' or Covered Employment & Wages program.

**Does the OES program have any data on unemployment for specific occupations?**

No. The OES survey does not produce estimates on unemployment. However, there is some information on selected unemployment indicators (including broad occupational groups) in *The Employment Situation* news release, which is part of Labor Force Statistics from the Current Population Survey. More detailed information on characteristics of the unemployed can be obtained by contacting the Labor Force Statistics staff.

**Does the OES program have any information on job vacancies?**

No. The OES survey does not ask establishments for information about any vacancies they may have. The U.S. Department of Labor maintains a web site where job seekers can search America's Job Bank for job vacancies.

**Does the BLS have employment projections for specific occupations?**

For more than 50 years, the Bureau's Occupational Outlook Handbook has been a nationally recognized source of career information. It describes what workers do on the job, working conditions, the training and education needed, earnings, and expected job prospects for a variety of occupations.

**How are "employees" defined by the OES survey?**

Employees are all part-time and full-time workers who are paid a wage or salary. The survey does not cover the self-employed, owners and partners in unincorporated firms, household workers, or unpaid family workers.

**Does the BLS have occupational employment estimates that include the self-employed?**

The Bureau of Labor Statistics' Office of Employment Projections provides current and projected national economy-wide (across all industries, including the self-employed) occupational employment estimates for selected occupations.

**How are "wages" defined by the OES survey?**

Wages for the OES survey are straight-time, gross pay, exclusive of premium pay.

**Included** in the collection of wage data are:

- base rate,
- cost-of-living allowances,
- guaranteed pay,
- hazardous-duty pay, incentive pay including commissions and production bonuses, and
- on-call pay and
- tips

**Excluded** from the wage data are:

- back pay,
- jury duty pay,
- overtime pay,
- severance pay,
- shift differentials,
- non-production bonuses, and
- tuition reimbursements.

**How long has the OES survey collected wage data?**

The OES survey collected both occupational employment and occupational wage data nationwide for the first time in 1996. Prior to 1996, occupational employment estimates by industry were the only national OES estimates produced by the BLS.

**What are mean wages? What are median wages?**

The OES program produces estimates of wages by occupation; i.e., the wages paid to wage or salary employees in a given occupation in the U.S., in a particular state, or in a particular industry. These occupational wage estimates are either estimates of mean wages or median wages.

- A mean wage is an average wage. An occupational mean wage estimate is calculated by summing the wages of all the employees in a given occupation (either in the U.S., a particular state, or a particular industry) and then dividing the total wages by the number of employees.
- A median wage is a boundary. An occupational median wage estimate is the boundary between the highest paid 50% and the lowest paid 50% of workers in that occupation (either in the U.S., a particular state, or a particular industry). Half of the workers in a given occupation earn more than the median wage, and half the workers earn less than the median wage.

**How is the OES survey conducted?**

The Occupational Employment Statistics (OES) survey is an annual mail survey measuring occupational employment and wage rates for wage and salary workers in nonfarm establishments, by industry. The survey samples approximately 400,000 establishments per year, taking 3 years to fully

collect the sample of 1.2 million establishments. BLS and the Employment and Training Administration (ETA) provide the funding for the survey. BLS provides the procedures and technical support, while the State Employment Security Agencies (SESAs) collect the data. The SESAs produce occupational estimates by detailed industries for local areas and the states. BLS produces similar industry-specific estimates for the nation as well as employment and wage estimates for 750 occupations across all industries for the nation, each of the 50 states plus the District of Columbia, and Metropolitan Statistical Areas (MSAs).

**When will this year's OES estimates be available?**

The OES program produces estimates from data collected in an annual nationwide survey. The survey begins with survey materials being sent to selected establishments during the last quarter (October, November, December) of the survey year. Data collection starts then and continues into the early months of the following year. As the data collection finishes, the data entry and estimates processing begins, and this is followed by estimates production and validation. The OES estimates are released in the last quarter of the year following the survey.

**What occupations are surveyed?**

An establishment responding to the OES survey should report all employment according to the OES classification system, which is an empirically-based economy-wide occupational classification system. The OES occupational classification system identifies over 750 occupations. Each OES occupational classification comprises a title, a definition, and a five-digit OES code.

**How does the OES program classify occupations?**

The 1999 National Occupational Employment and Wage Estimates were produced using the revised Standard Occupational Classification (SOC) system. The new SOC system, which will be used by all Federal statistical agencies for reporting occupational data, consists of 821 detailed occupations, grouped into 449 broad occupations, 96 minor groups, and 23 major groups. The OES program provides occupational employment and wage estimates at the major group and detailed occupation level. Due to the OES survey's transition to the new SOC system, the 1999 OES estimates are not directly comparable with previous years' OES estimates, which were based on a classification system having 7 major occupational groups and 770 detailed occupations. Approximately one-half of the detailed occupations were unchanged under the new SOC system, with the other half being new SOC occupations or occupations that are slightly different from similar occupations in the old OES classification system. The detailed SOC occupations are allocated among these twenty-three major groups:

1. Management Occupations
2. Business and Financial Operations Occupations
3. Computer and Mathematical Occupations
4. Architecture and Engineering occupations
5. Life, Physical, and Social Science Occupations
6. Community and Social Services Occupations
7. Legal Occupations
8. Education, Training and Library Occupations
9. Arts, Design, Entertainment, Sports, and Media Occupations
10. Healthcare Practitioners and Technical Occupations
11. Healthcare Support Occupations
12. Protective Service Occupations
13. Food Preparation and Serving Related Occupations

14. Building and Grounds Cleaning and Maintenance Occupations
15. Personal Care and Service Occupations
16. Sales and Related Occupations
17. Office and Administrative Support Occupations
18. Farming, Fishing, and Forestry Occupations
19. Construction and Extraction Occupations
20. Installation, Maintenance, and Repair occupations
21. Production Occupations
22. Transportation and Material Moving Occupations
23. Military specific Occupations (not surveyed in OES).

The old OES occupational classification system used to produce the 1998 National, State, and Metropolitan Area Occupational Employment and Wage Estimates and 1998 National Industry Staffing Pattern Estimates (as well as earlier estimates) has these seven divisions:

1. Managerial and Administrative
2. Professional, Paraprofessional, and Technical
3. Sales and Related
4. Clerical and Administrative Support
5. Service
6. Agricultural, Forestry, and Fishing
7. Production, Construction, Operating, Maintenance, and Material Handling.

**Is the OES classification system compatible with other occupational classification systems?**

Yes. The 1999 OES classification system is compatible with the 2000 Standard Occupational Classification (SOC) system. The new SOC system will be used by all Federal statistical agencies for reporting occupational data. The old OES classification system is compatible with the 1980 Standard Occupational Classification system and the U.S. Bureau of the Census occupational classifications. By using a "crosswalk" to the SOC or Census system users can compare OES estimates with occupational data from other sources. The NOICC Crosswalk & Data Center Home Page is the source of various "crosswalks" that are used to link the occupational classifications of one system to those of another.

**How does the OES program define industry classifications? What is the SIC?**

The OES program uses definitions of industries found in the Standard Industrial Classification (SIC) system. The SIC system is used throughout the federal government to group establishments into industries. The SIC Division Structure makes it possible to collect and calculate establishment data by broad industrial divisions (labeled A through K), industrial groups (the 2- and 3-digit SIC levels), and specific industries (the 4-digit level). See the Standard Industrial Classification Manual, 1987 (Executive Office of the President, Office of Management and Budget), available in many libraries. The OES survey produces occupational employment and wage estimates for 2- and 3-digit SIC industrial groups. (Note: OES estimates of government employment and wages do not correspond to the SIC system. In the case of government, the OES survey produces occupational employment and wage estimates for Local Government, State Government, and Federal Government.)

**What industries are surveyed? What industries are not surveyed?**

The OES survey collects occupational employment and wage data from establishments in nonfarm industries. The OES survey produces estimates of occupational employment and wages for 2- and 3-digit industrial groups in these industrial divisions: Mining; Construction; Manufacturing;

Transportation, Communication, Electric, Gas, and Sanitary Services; Wholesale Trade; Retail Trade; Finance, Insurance, and Real Estate; Services; and Government.

The OES program does not survey establishments in SIC 01 (Agricultural production--Crops); SIC 02 (Agricultural production--livestock and animals specialties); SIC 08 (Forestry); and SIC 09 (Fishing, hunting, and trapping). SIC 88 (Private households) is not surveyed.

### Statement Regarding ERI's Assessor Series Norms for Use with Immigration Prevailing Wage Analyses/Reports

Presently, it is ERI's understanding that each state's employment security agency makes its own interpretation of the guidelines in GAL No. 2-98 and the new GAL No. 1-00. Consequently, the year of 1998 and 1999 found that many different state interpretations of GAL No. 2-98 were made. Hopefully, with time, there may become a more consistent interpretation of GAL No. 2-98 among the states especially in light of GAL No. 1-00. Many employers and attorneys are reporting that the prevailing wage determinations made by states (based on OES data) are unreasonably high. Others have raised the question as to whether or not the present application of the regulations should be legally challenged. Some states appear not to be accepting many "other survey" datasets (with Texas leading the way). Other states are reported (such as Utah) to not accept other survey data unless prepared by an independent third-party.

Canada, to ERI's knowledge, has no regulations or laws similar to that of GAL No. 2-98.

However, many states are accepting ERI Economic Research Institute Assessor findings related to prevailing wages as a supplement to OES data. It should be noted that ERI's DOS **Salary Assessor** (first released in 1988) was not designed for GAL No. 2-98, which was issued October 31, 1997. ERI presents a "Private Survey Comparison" (tested in 1998 as a module of the Windows **Salary Assessor** and now part of the **Geographic Assessor**) as a direct response to GAL No. 2-98. The norms found in the **Geographic Assessor** are imported medians reported by **SalariesReview.com**. They are produced so that a user may ascertain the reasonableness of an OES reported value. Should there be significant differences, further research may be warranted (most likely because OES class composition is masking the true pay of a position).

While many states are accepting our findings, three states (to our knowledge at this time) are not: New York, California, and New Jersey. While their interpretations appear to be based on the pre-GAL 2-98 version of ERI's old products, **Salary Assessor** DOS and not the **Geographic Assessor** Win95/98/NT/ME/XP, their comments are cited below.

ERI data is based on multiple surveys that help assure all industry coverage per GAL No 2-98. However, New Jersey has interpreted the GAL guidelines as follows: *"...the regulations outlined in General Administrative Letter No. 2-98 (GAL 2-98) do not allow for combining of wage data from separate surveys...."*

Under this definition, it appears the only single wage survey that will comply with New Jersey's interpretation is the OES survey itself. Few, if any, single published surveys (except OES) cover all industries in every location. And the fact that, to our knowledge, the Level I and Level II prevailing wage means have not been published by New Jersey puts the state's services in a commanding position.

Another objecting state is New York, which is concerned that because ERI data is based on multiple wage surveys, imbalance may be created by the double weighting of certain companies' data. New York's concerns include: *"What steps were taken to insure that the employees in the component surveys are not represented more than one company? It is noted that the inclusion of results (by ERI) from OES and BLS National Compensation Survey makes duplication representation highly likely."*

This interpretation apparently means that in the State of New York, a survey can only be used if the companies that participate in one wage survey do not provide data to any other wage surveys during the two year period specified in GAL No. 2-98 (either a private survey or a government survey). If a company provided data to more than one survey during a two year period, then those surveys may not be used as part of a multiple survey approach. Being that ERI uses both private and governmental wage surveys and that

most major employers participate in more than one survey over a two year period, this interpretation appears to effectively block the use of multiple survey analyses in the State of New York (until such time as someone introduces New York statisticians to the Central Limit Theory).

At some future date the Department of Labor may release further guidelines to bring about consistency among the states in their interpretations of GAL No. 2-98 and 1-00. In the interim, ERI Economic Research Institute does not plan on developing a new methodology or product each time one State makes a different interpretation of GAL No. 2-98. Only when the Department of Labor issues further clarification of GAL No. 2-98 will ERI review its Prevailing Wage methodology to comply as best it can with DOL interpretations of GAL No. 2-98. At this time, ERI cannot predict which States will or will not accept **Assessor** analyses for immigration application purposes. It, therefore, presents them as Prevailing Wage Comparisons. **Assessors** report both medians and means.

### Statement Regarding ERI's Trend Analysis of OES Data

This data is presented free of charge to any Internet inquirer and is non-copyrighted. ERI cannot be liable for errors in the data download, nor does it present the "trending" of this data as acceptable to any Government agency for immigration purposes. All calculations of a "trend" average can be "reengineered" by utilizing the means shown at the bottom of each page/report (calculating the  $y = a + bx$  equation). We again note the large differences between OES reported 1997, 1998, 1999, 2000, 2001, 2002 and 2003 data and the consequent larger predictions (that may be unrealistic). These differences are now, of course meaningless with the change of job descriptions being surveyed. ERI has not altered OES data, and presents trends as they were calculated. The same is true for Canadian Census data.

Whether any State Agency will accept a trending of data is unknown.

Finally, we apologize for this lengthy methodology. The application of OES data (and this year's complete revision of the survey using SOC codes) is an evolving process. This methodology's prose will continue to be modified as we learn and report upon the evolution of this process and survey. With the before-mentioned changing of all the position descriptions (SOC prose versus OES prose), Year 2004 data presentations likely will be even more complex.

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